WORK PLAN
CONTRACTOR QUALITY CONTROL PLAN
SAMPLING AND ANALYSIS PLAN
HEALTH AND SAFETY PLAN
SOIL REMOVAL FROM BUILDING 123
HUNTERS POINT SHIPYARD
SAN FRANCISCO, CALIFORNIA

Contract No. N62474-93-D-2151
Delivery Order No. 0132

Submitted to:

Department of the Navy
Engineering Field Activity, West
Naval Facilities Engineering Command
900 Commodore Drive, Building B-208
San Bruno, California 94066-2402

Submitted by:

IT Corporation
4585 Pacheco Boulevard
Martinez, California 94553

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Thomas A. Davis
IT Program Contractor Quality Control Manager

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IT Program Manager

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List of Acronyms and Abbreviations

BAAQMD	Bay Area Air Quality Management District
CCR	California Code of Regulations
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CFR	Code of Federal Regulations
CO	Carbon monoxide
COC	Chemicals of concern
CQC	Contractor quality control
CSO	Caretaker's Site Office
DO	Delivery order
EFA West	Engineering Field Activity, West
EPP	Environmental protection plan
EZ	Exclusion zone
FWV	Field work variance
HPS	Hunters Point Shipyard
IR	Installation Restoration
IT	IT Corporation
NPL	National Priorities List
PAH	Polyaromatic hydrocarbons
PCB	Polychlorinated biphenyls
PEL	Permissible exposure limit
PMO	Program Management Office
PPE	Personal protective equipment
PWC-SFBA	Public Works Center - San Francisco Bay Area
RFI	Request for information
ROICC	Resident Officer in Charge of Construction
RWQCB	Regional Water Quality Control Board
SAP	Sampling and Analysis Plan
SHSP	Site Health and Safety Plan
SOP	Standard operating procedure
yd^3	Cubic yards

1.0 Introduction

IT Corporation (IT) has been contracted by the United States Department of the Navy, Engineering Field Activity, West (EFA West) to remove and dispose approximately 3,200 cubic yards (yd^3) of soil from Building 123 at Hunters Point Shipyard (HPS), San Francisco, California (Figure 1). This project will be performed in accordance with the Revised Scope of Work provided by the Department of the Navy, dated July 2, 1998 for Delivery Order (D.O.) 0132, Contract Number N62474-93-D-2151.

1.1 Background

HPS is a 936 acre military complex situated in the southeastern edge of the City and County of San Francisco, on a peninsula extending east into San Francisco Bay. Approximately 493 acres of the facility lie above the high tide line of the San Francisco Bay. After receiving the title of HPS in 1940, the federal government developed and operated Naval facilities until deactivated in 1974. Portions of the facility were leased for commercial use from 1976 to 1986 at which time the Navy resumed occupancy for use until 1994. In 1989, HPS was placed on the National Priorities List (NPL) pursuant to the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA). The Defense Base Realignment and Closure Act of 1990 (Public Law 101-510) initiated the closure of activities to make the property available for nondefense use.

Building 123 is located on Lockwood Street (at the northern end of the shipyard) and covers an area of approximately 500 feet by 150 feet, as shown on Figure 1. The building is situated on Installation Restoration (IR) Site 10, within Parcel B. The soil stockpiled within Building 123 was initially excavated from the Tank Farm (IR Site 6) at HPS, and includes the remains of a bioremediation pilot study conducted by the Navy Public Works Center - San Francisco Bay Area (PWC-SFBA) and CH2M Hill. The study was discontinued in early 1997. D.O. 132 continues the work begun under D.O. 006, Modification 11.

The primary sources of contamination at the Tank Farm where the soil was excavated from were spills from the tanks used by the Navy to store diesel fuel, lubrication oil, and possibly Stoddard

solvents. The primary chemicals of concern (COCs) are polychlorinated biphenyls (PCBs), polyaromatic hydrocarbons (PAHs), lead, arsenic, beryllium, and manganese (CH2M Hill, 1996).

1.2 Site Conditions

Building 123 is constructed primarily of wood (with a wood truss roof), covering an area of approximately 500 feet by 150 feet. Figure 2 provides a plan view schematic of the pertinent building and soil stockpile features. The soil within Building 123 is currently segregated into four square, prismoidal stockpiles, each with approximate base dimensions of 65 feet by 65 feet and top dimensions of 25 feet by 25 feet. The stockpiles cover a total length of approximately of 350 feet, with an average height of approximately 9 feet. The stockpiles are uncovered and resting on the concrete floor of the building. Bioremediation aeration equipment is set up along the west side of three of the stockpiles. Each set of aeration equipment consists of a moisture separator drum, a filter, a blower, an activated carbon drum, and polyethylene tubing leading to the stockpile.

Since the building was originally used as a storage facility for the Navy, there are numerous access doors and loading bays located around the perimeter of the structure. The west side of the building functioned as a loading dock. An access door measuring approximately 12.5 feet in width by 15 feet in height is located on the east side of the building and six access doors measuring approximately 12 feet in width by 10 feet in height are located along the west side of the building. There are also 14 loading bays measuring approximately 9 feet in width by 11 in height distributed along the central portion of the west side of the building. The top of Building 123 also contains numerous windows distributed around the perimeter.

1.3 Objectives and General Approach

The primary objectives of the project are to:

- Sample and dispose the soil located in Building 123;
- Dispose the carbon absorption drums; and
- Stockpile the aeration equipment in the south portion of Building 123.

Several preparatory and support activities are involved with these construction activities (Figure 3), including installing personnel and equipment decontamination facilities, shutting down electrical power for the building, and performing the necessary analytical testing required for the

project. The general approach will be to load the soil into trucks for subsequent transport to a Navy-approved off-site disposal facility.

This Work Plan includes an Environmental Protection Plan (EPP [Section 4.0]) and a Traffic Control Plan (Section 5.0). Information usually found in a Materials Handling Plan and Spill Prevention Plan is incorporated into Section 3.0 (Construction Activities) and Section 4.0 (EPP) of this work plan, respectively. In addition, IT has prepared a Site Health and Safety Plan (SHSP [IT, 1998b]), a Contractor Quality Control (CQC) Plan (IT, 1998c), and a Sampling and Analysis Plan (SAP [IT, 1998d]) under separate covers.

2.0 Mobilization and Preparatory Work

Prior to mobilization to the site, a preconstruction/mutual understanding meeting will be held. The meeting will be attended by representatives of IT, EFA West, the Resident Officer in Charge of Construction (ROICC), and key subcontractors. The meeting will address the scope of work, roles of project personnel, project schedule, and contractual requirements to be fulfilled by the contractors.

2.1 Mobilization

Personnel, vehicles, equipment, materials, and temporary facilities necessary to execute the project will be mobilized as needed to HPS. The majority of project personnel will be local to the Bay Area. Personnel with specialized skills may be utilized from other regions to expedite the project. Personnel requiring access to HPS will require proper identification. For vehicle access, the following documentation must be provided to HPS security:

- Valid driver's license;
- Valid vehicle registration; and
- Proof of insurance.

The following heavy equipment is proposed for this project:

- Rubber-tired front-end loader;
- Rubber-tired backhoe;
- Dump trucks;
- Water truck;
- Power sweeper; and
- Water collection tank.

This list is subject to modification to accommodate the project.

2.2 Temporary Facilities and Site Setup

IT will be using facilities established for D.O. 109 for office space and parking. A temporary project office will be established within the existing IT site trailer (located just northeast of Building 123), as shown on Figure 1. If necessary, secured storage containers will be mobilized to the job site to store materials and small tools and equipment. Temporary fencing will be set up, as necessary, in the vicinity of Building 123 to protect the public, and to secure the equipment and material from theft or vandalism. Portable toilets and refuse containers will be set up, as

necessary, near the work areas. Traffic control devices (barricades, cones, and delineators) and signage will be implemented, as necessary, to manage pedestrian and vehicular traffic.

2.3 Personnel and Equipment Decontamination Facilities

A decontamination area for equipment will be established near Building 123. This decontamination area will be used to clean heavy equipment, bins, trucks and associated tools and equipment. At a minimum, decontamination areas will consist of a low permeability surface (e.g., polyethylene sheeting) to collect material removed from equipment for subsequent disposal. Where a greater effort of decontamination is required (e.g., pressure washing), the station may include a bermed area with a low permeability surface and a low point for the collection of liquids. In cases when decontamination operations cause penetrations in the liner, the liner will be repaired or replaced. The Project Superintendent or Project Manager will determine if a protective layer (e.g., geosynthetic material, soil layer, etc.) is needed to protect the liner. A decontamination water source and rinsate water collection tank will be located at the station, as necessary.

Exclusion zones and personnel decontamination areas will be established at the location of the work activity, as outlined in the SHSP.

2.4 Permits and Notifications

Hot work permits will be obtained from the HPS Fire Department prior to conducting activities that require an open flame, such as using cutting torches or welding equipment. Permission to interrupt utility services will be requested from the HPS CSO prior to the date of interruption. IT will notify the HPS Fire Department, HPS Security, ROICC, and CSO at least three working days in advance of street or alley closure, or when implementing a construction detour. The ROICC will assist IT in notifying and contacting any other parties that may be affected by the project.

2.5 Soil Sample Collection

Soil samples will be collected from the stockpiles within Building 123, as described in the SAP, in order to profile the waste for subsequent disposal at a Navy-approved off-site facility.

3.0 Construction Activities

After mobilization and preparatory activities are completed, construction activities will begin. Necessary notifications will be made, as outlined in Section 2.4. The following sections describe the details of each activity.

3.1 Facility Shutdown

Electrical power at Building 123 will be turned off (locked out/tagged out) by the Navy, as discussed during negotiations associated with this D.O. IT will then disconnect, dismantle, inventory, and stockpile all aeration equipment associated with the bioremediation study in the south portion of the building. In the event the vapor extraction system is energized, all lock out/tag out procedures will be conducted in accordance with IT Policies and Procedures (IT, 1998a). If the system has been de-energized, lock out/tag out procedures may not be applicable.

3.2 Soil Loading, Transportation, and Disposal

The soil in Building 123 will be loaded directly into dump trucks (most likely 20 yd^3 end dumps) through openings along the west or east sides of the building (as described in Section 1.2). If possible, trucks may also enter the building through one of these openings, for direct loading within the building. Carbon monoxide (CO) levels will be monitored during soil removal activities (as described in the SSHP) and, if necessary, air blowers will be placed within the building to maintain a safe working environment.

The trucks will be covered with tarps, inspected for exterior soil, and decontaminated, as necessary, within the decontamination area described in Section 2.3. Decontamination, if necessary, will generally consist of scraping or broom sweeping the exterior frame and/or tires free of material collected during soil removal activities. If necessary, additional procedures, such as water rinsing or pressure washing will be implemented. The soil will then be transported to a Navy-approved off-site disposal facility (most likely Forward Landfill in Manteca, California - a CERCLA-certified disposal facility). Truck weights may be measured on site (through the use of portable scales) or at a nearby scale. The total quantity of contaminated soil, is estimated to be approximately 3,200 yd^3, or 800 yd^3 per stockpile.

Equipment exiting an exclusion zone (EZ) will be inspected for the need for decontamination. Decontamination will be implemented in accordance with IT Standard Operating Procedure (SOP) 6.2 (IT, 1996b), unless determined otherwise. As necessary, personnel exiting the EZ will follow decontamination procedures in accordance with the SHSP. All wastes collected from decontamination activities will be disposed in accordance with material handling protocols for the controlling COC.

3.3 Facilities Removal and Demobilization

IT will power sweep the concrete floor in Building 123 after soil loading activities are complete. The collected soil and debris will be disposed with the contaminated soil. A postconstruction "walk-through" survey will be conducted by appropriate IT and Navy representatives. At a minimum, this survey will include the CSO and CQC Manager. Postconstruction site conditions will be approved by the Navy prior to demobilization. If necessary, a punch list will be prepared, in order to track remaining field project requirements.

Demobilization will consist of the disposition of government-owned property; removal of the construction equipment, tools, and supplies; and evacuation of the temporary office space. Temporary fence, traffic control devices, signs, storage containers, portable toilets, and refuse containers will be removed from the site. Construction-related debris will be removed and disposed and work areas will be cleaned and returned to their original condition. Decontamination facilities for personnel and equipment will be disassembled, and the materials will be properly disposed.

4.0 Environmental Protection Plan

The following EPP presents IT's approach to preserving and protecting existing environmental conditions during the soil removal project at Building 123. The EPP for this project has been developed to prevent the spread of contamination from the work areas, and to minimize disturbance of natural and historic resources, as well as existing facilities at Hunters Point.

4.1 Regulatory Jurisdiction

The Building 123 soil removal project will be carried out in accordance with the requirements specified in the Code of Federal Regulations (CFR), Title 40, Sections 261, 264, and 265 and the California Code of Regulations (CCR), Title 22.

4.2 Preconstruction Survey

A site walk will be conducted by IT personnel and the ROICC prior to construction activities to assess the environmental conditions in the work area and to determine additional environmental protection requirements for the project. Preconstruction conditions will be documented using photographs and/or video, as necessary; and potentially environmentally sensitive areas that might be adversely impacted by construction activities and corrective measures will be identified.

4.3 Protection of Natural Resources and Sensitive Structures

The following sections describe the procedures and precautions IT will take to minimize any impact to natural resources and sensitive structures due to construction activities.

4.3.1 Protection of Vegetation

IT will verify that no sensitive and/or endangered plant species are known to inhabit the Building 123 area. The work areas and vicinity are mostly paved, therefore, no special precautions to protect vegetation are anticipated to be necessary.

4.3.2 Protection of Animals

IT will verify that the Site 4 work areas are not known to serve as animal habitats. The excavation is not expected to present a hazard to wandering pets or urbanized species such as racoons or skunks.

4.3.3 Protection of Special Status Species

IT will verify that there are no endangered animal or plant species inhabiting the Building 123 area.

4.3.4 Protection of Water Resources

The closest surface water source to the soil removal activities is San Francisco Bay, which is located approximately 500 feet northeast of Building 123, therefore a direct impact to surface water is not expected. Secondary containment utilizing polyethylene sheeting or diversion berms, will be utilized, as required, in areas adjacent to drains. Groundwater is not expected to be encountered during this project.

4.3.5 Protection of Air Resources

Construction activities associated with this project will be conducted in a manner so as to minimize the release of airborne particulates within or outside the project boundary. Air monitoring will be employed to verify the effectiveness of the program and to address direct effects on site workers. Air monitoring requirements are addressed in Section 8.1 of the SHSP.

Construction activities associated with this project may result in release of respirable particulates. The work procedures will be designed to control, prevent, and minimize these releases. Fugitive dust emissions during the excavation activities will be controlled by spraying water from a water truck or nearby fire hydrant. Spraying will be conducted, as necessary, on the soil removal areas, access roads, and haul roads during the day. At the end of each workday, the work areas will be swept or washed, as appropriate, to minimize the potential for fugitive dust during the evening hours. Control measures (e.g., power sweeping) will be implemented for dust particles from all construction activities during normal working hours.

Hot work permits and any work requiring an open flame or posing a potential fire hazard will be coordinated with the HPS Fire Department.

IT will comply with OSHA and applicable local noise standards. Equipment operators, contractors, and other personnel will be required to wear appropriate hearing protection, as detailed in the SHSP.

4.3.6 Protection of Cultural Resources

No cultural resources are reported in the Parcel B Feasibility Study (Tetra Tech, 1997) for the proposed work area. IT does not expect to encounter cultural resources in the work areas under this D.O., however, in the event of a discovery of cultural resource features, deposits, or remains during construction, IT and its subcontractors will halt work in the immediate area and immediately report the finding to the ROICC so that the proper authorities will be notified. Presently, no intrusive work is scheduled under this D.O.

4.4 Potential Pathways

4.4.1 Airborne Particulates

Should dust emissions be determined to exceed nuisance levels during construction activities from visual observation by IT supervisory personnel, control measures shall be implemented. Nuisance levels of dust will be determined by IT field personnel, in conformance with the SHSP. The primary control measure for dust suppression will be water spraying. The frequency and volume of spraying will be determined by weather conditions and visual observation.

Equipment will be available to provide light water spraying of work areas to minimize fugitive dust emissions during field work. In addition, frequently traveled areas and active soil stockpiles will be wetted to control fugitive dust. Visual monitoring of the work site for dust generation will be combined with air monitoring to determine the effectiveness of the dust control measures and to determine water spraying frequency.

4.4.2 Airborne Vapors

Fugitive hydrocarbon emissions/vapors may occur at the soil stockpiles or within the loaded trucks. The loaded trucks will be covered with tarps and decontaminated prior to leaving the Building 123 work area. Air monitoring will be performed at the work areas to monitor vapor emissions. The SHSP contains the action levels for airborne chemicals. If airborne vapor levels exceed the permissible exposure limits (PEL), affected work will stop. It is not anticipated that elevated levels of vapors will extend beyond the work site, however, if this occurs, the Navy CSO and ROICC will be notified immediately. The vapor monitoring program is discussed in further detail in the SHSP.

4.5 Materials Handling

Both contaminated and non-contaminated waste may be generated during project activities. These wastes will be properly managed to mitigate environmental impacts and comply with applicable regulations. Disposal activities will be conducted in accordance with applicable regulations.

4.5.1 Waste Disposal

Soil removed from Building 123 will be loaded directly into bulk carriers, which will be covered with tarps and decontaminated by brushing or washing down the exterior and tires, as necessary, prior to leaving HPS. Soil samples will be collected and analyzed to determine proper disposal methods. Solids collected in the equipment decontamination area will be disposed with the contaminated soil. If Level C PPE is required during a work activity, personnel decontamination areas will be set up at the location of the activity.

Contaminated soil will be transported and disposed at a Navy-approved off-site facility that is permitted to receive the material. IT will submit copies of analytical test results to the disposal facility in order to obtain disposal permits. It is not anticipated that hazardous wastes will be generated during the project. If hazardous waste is encountered, IT will stop the affected portion of the work and notify the Contracting Officer immediately.

4.5.2 Disposal of Construction Related Liquids

Liquid wastes generated during the construction activities will be collected and stored in drums or portable tanks and analyzed in accordance with the Sampling Plan. The liquids will be transported for disposal at a Navy-approved off-site facility that is permitted to receive the material. All removal and disposal activities will be conducted in accordance with appropriate regulations.

4.6 Restoration and Protective Procedures

IT will power sweep the interior of Building 123 after soil removal activities are complete. Reasonable efforts will be made to restore the work areas to conditions which meet or exceed their state prior to construction activities. Preconstruction conditions will be documented in the preconstruction survey.

4.7 Spill Notification and Response

If an on-site spill occurs, IT will immediately notify the Navy, who will, in turn, notify the Office of Emergency Services, the Regional Water Quality Control Board (RWQCB), and other applicable agencies, as required. The SHSP describes the emergency response and contingency plan and lists the phone numbers for the points of contact for IT Program Management Office (PMO), the Navy, and other applicable emergency responders.

Spill containment gear, including brooms, shovels, pumps, hoses, and absorbent pads will be stored in designated storage areas.

Personnel will be trained per the SHSP in the use of this equipment. Response procedures including the location of these supplies will be discussed during daily tailgate safety meetings. Spills or discharges and actions taken to mitigate the situation will be recorded by site personnel in the daily field logs. A written report will be sent to the RWQCB within five days of a spill describing the cause of the spill, the action taken to correct the problem, and the actions taken or that will be taken (with an appropriate schedule) to prevent such a discharge from recurring.

5.0 Traffic Control Plan

The following traffic control plan has been prepared to control and regulate traffic during soil removal activities at Building 123.

5.1 General

IT will provide traffic control for the duration of the project, including all resources necessary to place, operate, maintain, repair, transport, and remove traffic control devices. Traffic control methodologies will be implemented in consultation or conformance with HPS requirements. In general, the construction operations will be planned and conducted to minimize impacts on traffic flow and operations at HPS.

Access to nearby driveways, parking lots, and facilities along the path of soil removal and hauling will be maintained when regular access is temporarily closed. Existing access will not be closed until the replacement access route or facility is established and sufficient notice of upcoming construction activities will be provided to potentially impacted owners, tenants, and leasers. Construction zones will be secured at the end of each work day, through the use of warning signs, barricades, fence, and trench plates, as necessary. Equipment, materials, and tools associated with the project will also be secured. When construction operations are not actively in progress, IT will maintain all traveled lanes of the roadway, unless otherwise preapproved by the Navy. IT will notify the HPS Fire Department, HPS Security, ROICC, and CSO at least three working days in advance of street or alley closure, or when implementing a construction detour.

5.2 Traffic Control Devices

The primary traffic control devices to be used on this project are:

- Warning signs (to inform motorists of construction activities ahead);
- Detour signs (to close entire sections of road and detour traffic);
- Informational signs (to provide project-related and upcoming street closure information);
- Traffic cones or delineators (to control traffic flow around construction areas);

- Barricades with light-sensitive reflective lights or fencing (to isolate work areas and road areas from vehicles and pedestrians); and

- Flag men, as necessary (to route traffic around construction areas in special circumstances).

Existing striping, pavement markings, and signage altered during construction activities will be restored at the completion of work.

5.3 Offsite Hauling Route

Material scheduled for removal from Building 123, will be loaded directly onto trucks for transportation and disposal at an approved facility. The trucks will travel from the Building 123 area along Lockwood Street to Donahue Street, then out the Main Gate at Innes Avenue (Figure 1). After leaving HPS, the trucks will continue north on Innes Avenue, Hunters Point Boulevard, and Evans Avenue towards Interstate 280 and U.S. Highway 101. The hauling route will be verified and coordinated with the Navy. Truck weights may be measured on site (through the use of portable scales) or at a nearby scale.

5.4 Affected Roads

The primary HPS roads affected during construction activities are Lockwood Street, Donahue Street, and Innes Avenue.

5.5 Traffic Control Mechanisms

Areas closed to traffic will be cordoned off with fencing or barricades. Advance warning signs will be used, as necessary, to alert vehicles of activities and road conditions ahead. When soil removal activities require complete closure of portions of roads, detour signs will be erected at all adjacent roads and access ways leading to the affected area.

If soil removal activities cross facility access areas, access routes will be segregated from construction activities with barricades or delineators. If necessary, vehicles will be assisted by flag men.

Generally, walkways will be eliminated or restricted to the public. However, in cases where pedestrian access is critical, a temporary walkway will be established in the vicinity of the regular walkway and isolated with fencing, barricades, or delineators. If necessary, pedestrians will be assisted by flag men.

6.0 Post Construction Documentation

Within 45 days of project completion, a technical memorandum, or completion report will be submitted to the Navy. The memorandum will summarize the work performed and will include documentation of analytical test results, waste manifests, and soil quantities removed from Building 123. Materials, equipment and procedures used, requests for information (RFI) and field work variances (FWV) submitted, and problems encountered will also be provided in this summary.

Standard closeout procedures will be performed for this D.O. after field activities are complete.

7.0 Project Administration and Management

7.1 Project Organization

The Project Manager will be the point of contact for the Navy and will be responsible for project execution, continuity, and reporting. The Site Management Team will consist of a Project Administrator, Contractor Quality Control Manager, Health and Safety Officer, Project Engineer, and Superintendent. Support for the project will be provided by the PMO staff in Martinez.

7.2 Management Approach

The project will be implemented using management personnel located in the IT Martinez office. The Project Superintendent will manage and coordinate the daily activities of all IT personnel and IT's subcontractors.

Project costs will be accrued on a weekly basis and provided for the review of the Project Manager. The Project Manager will evaluate the progress of the project and maintain continual updates of the project schedule. In accordance with the contract, IT will provide this data to the Navy via monthly status reports.

7.3 Health and Safety

A Site Health and Safety Officer will be present at the site during field activities to ensure implementation of the requirements of the SHSP. Air monitoring will be performed during intrusive construction activities to monitor breathing zones. The majority of the work at the site will be performed in Level D (modified) PPE, however, the use of Level C PPE may be required during some activities. The SHSP details the hazards associated with the construction activities and lists appropriate measures to protect the health and welfare of the employees in the field.

7.4 Quality Control

The Site CQC Manager will be present at the site during the field activities to oversee sampling, testing, and inspections and to maintain the level of quality control required under the terms of the contract. The CQC representative will prepare Daily Quality Control Reports for submittal to the ROICC office. All submittals during the project will be reviewed by the authorized reviewers and the Site CQC Manager prior to transmittal to the Navy. CQC activities will be performed in accordance with the requirements defined in the project CQC Plan.

7.5 Project Administration

A Project Administrator will be assigned to provide administrative support to the Site Superintendent and Project Manager. The Project Administrator and associated PMO personnel perform the activities necessary for the implementation and performance of the project within applicable contractual and regulatory requirements. These functions include: acquiring and coordinating the receipt of materials, supplies, and equipment less than $25,000; assisting in the mobilization and setup of site construction facilities; establishing and maintaining project record files; overseeing the preparation of hourly employee time sheets; verifying compliance with the Davis-Bacon Act; controlling and tracking government property; and assisting in the preparation of vouchers and project closeout documentation.

7.6 Project Schedule

A detailed project schedule is shown on Figure 3. Preconstruction activities will be performed during August and September 1998. These activities include the preparation, submittal, review, and approval of the project plans. Soil sampling activities are scheduled to take place in early October 1998 and construction activities will most likely take place in mid-to-late October 1998. The duration of field activities is based on a work schedule of five days per week and ten hours per day.

8.0 References

CH2M Hill, 1996, ***Action Memorandum, Soil Removal Action Documentation for Tank Farm IR-6 Site***, October 9.

IT Corporation, 1996a, ***Program Contractor Quality Control Plan for Environmental Remedial Actions***, Revision 2, September.

IT Corporation, 1996b, ***Standard Quality Procedures/Standard Operating Procedures Manual***, Revision 1, October.

IT Corporation, 1998a, ***Health and Safety Policies and Procedures Manual***, Revision 2, September.

IT Corporation, 1998b, ***Health and Safety Plan, Soil Removal From Building 123, Hunters Point Shipyard, San Francisco, CA,*** Revision 0, September.

IT Corporation, 1998c, ***Contractor Quality Control Plan, Soil Removal From Building 123, Hunters Point Shipyard, San Francisco, CA***, Revision 0, September.

IT Corporation, 1998d, ***Sampling and Analysis Plan, Soil Removal From Building 123, Hunters Point Shipyard, San Francisco, CA***, Revision 0, September.

Tetra Tech EM Inc., 1996, ***Parcel B Feasibility Study, Draft Final Report, Hunters Point Shipyard, San Francisco, CA***, November 26.

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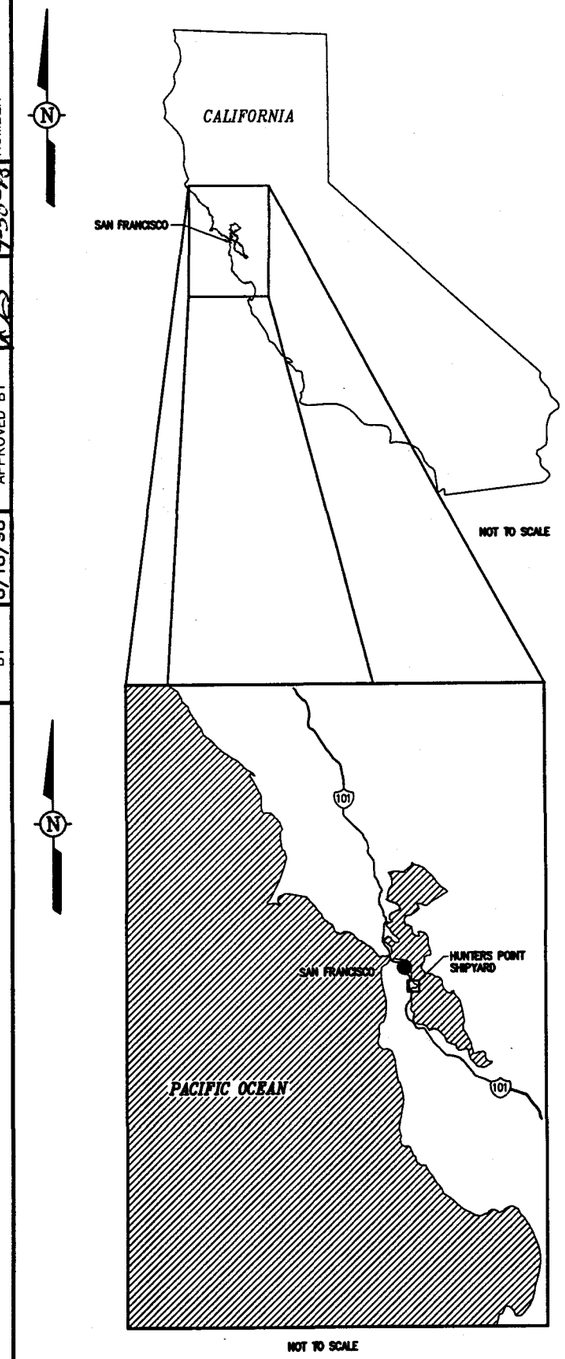

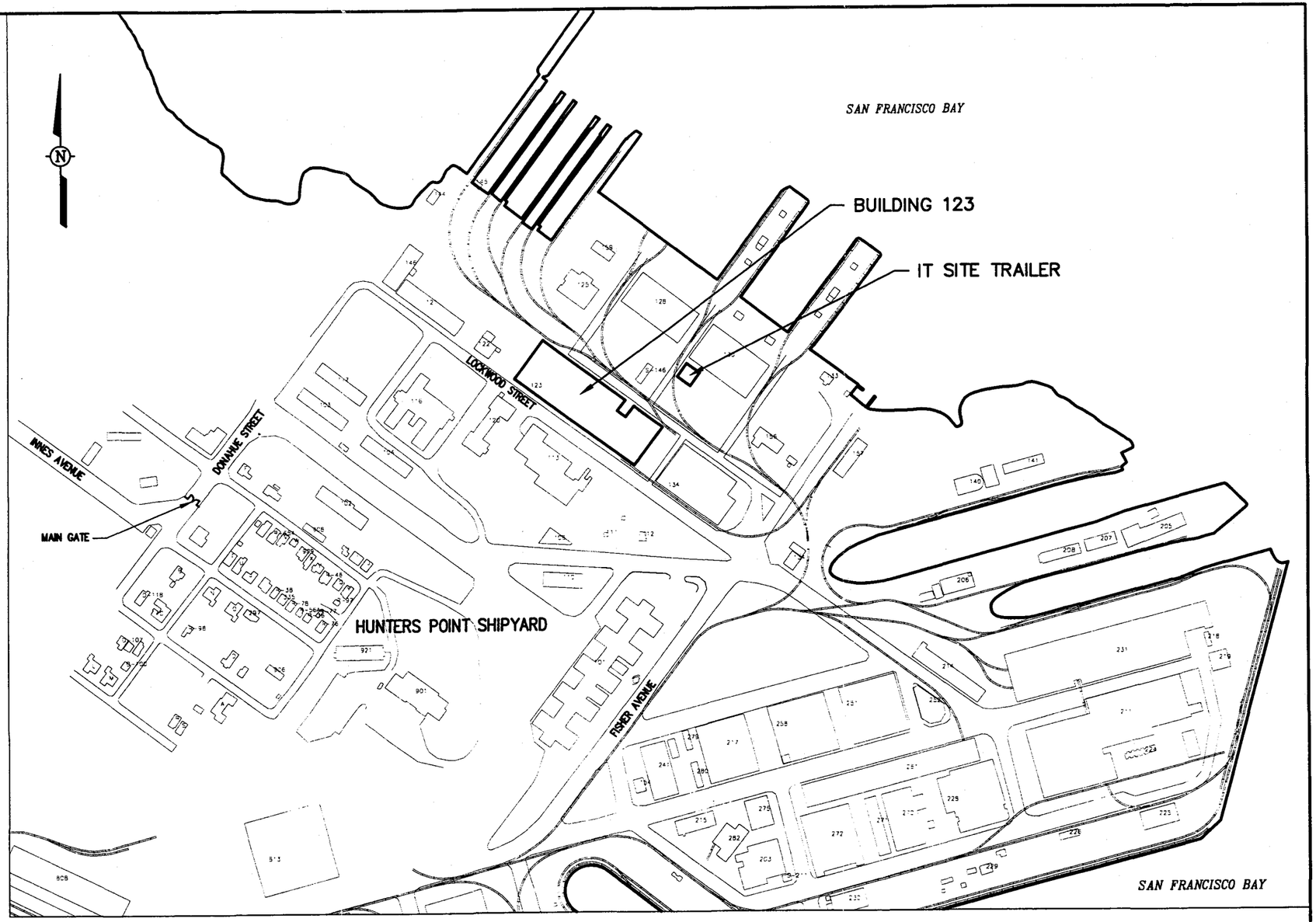

SCALE
0 400 800 FEET

FIGURE 1

SITE VICINITY MAP
SOIL REMOVAL FROM BUILDING 123
HUNTERS POINT SHIPYARD
DELIVERY ORDER #132
PREPARED FOR
DEPARTMENT OF THE NAVY
EFA WEST

INTERNATIONAL TECHNOLOGY CORPORATION

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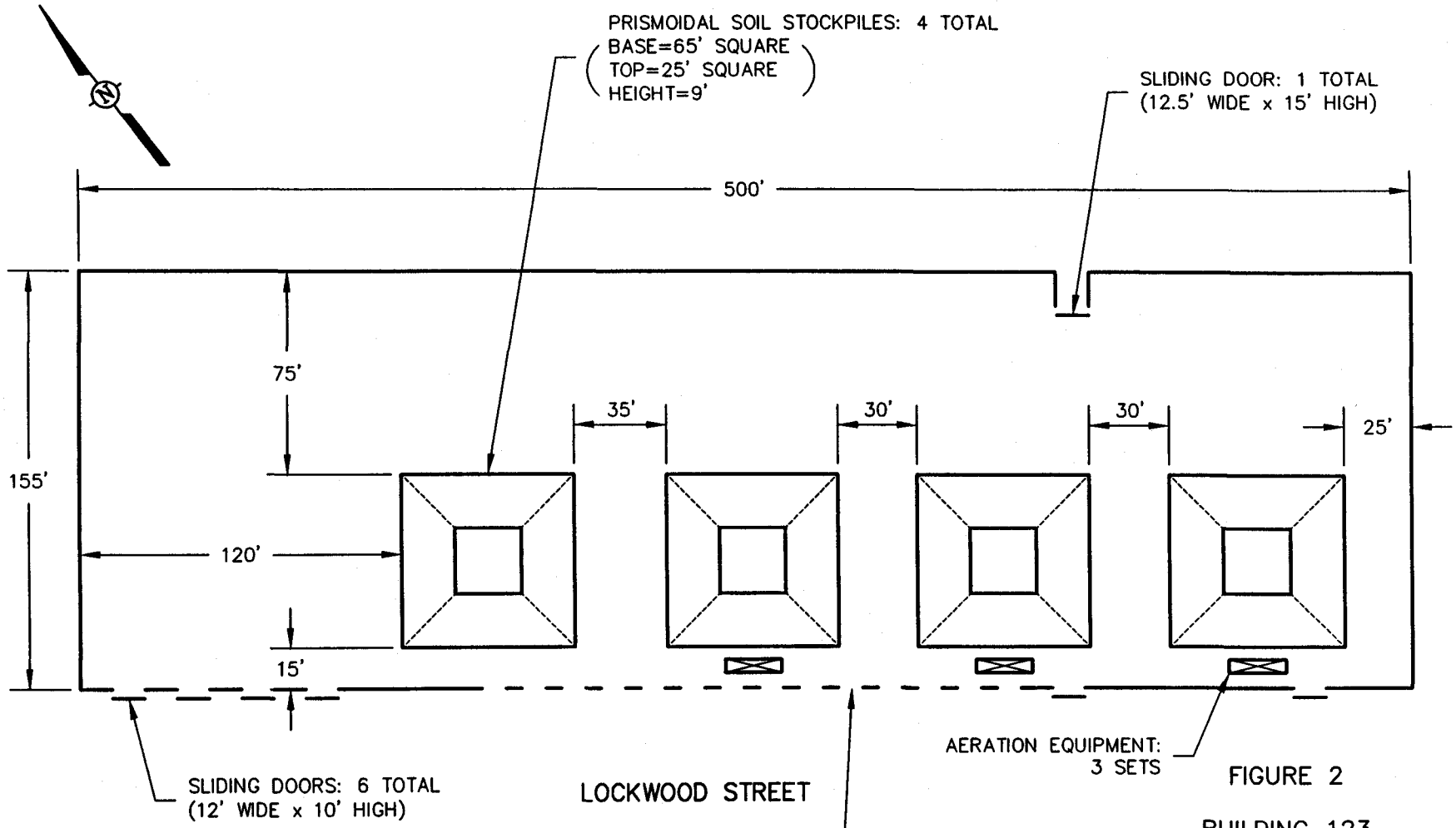


FIGURE 2

BUILDING 123
SOIL STOCKPILE CONFIGURATION
SOIL REMOVAL FROM BUILDING 123
HUNTERS POINT SHIPYARD
DELIVERY ORDER #132
PREPARED FOR
DEPARTMENT OF THE NAVY
EFA WEST

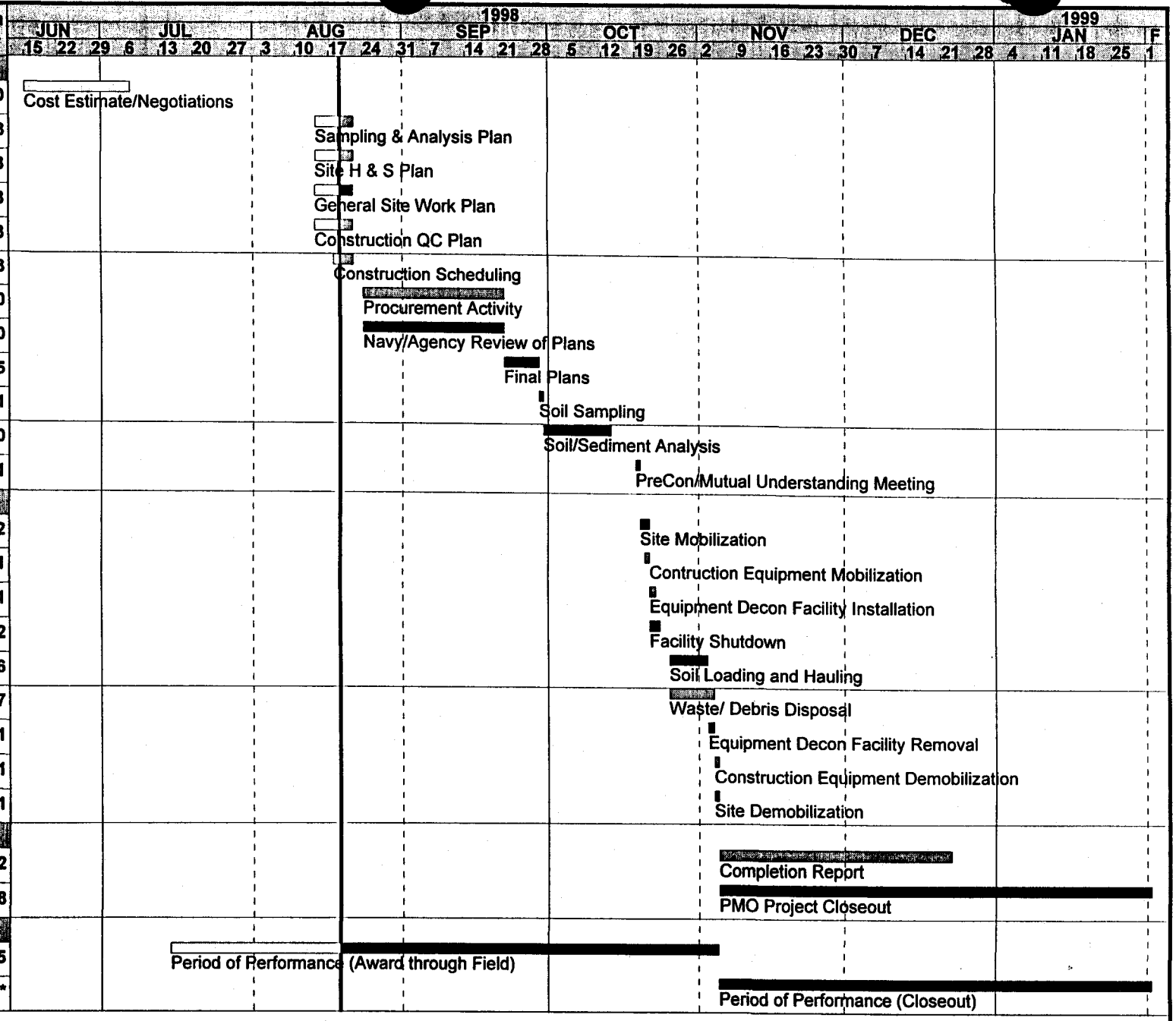
INTERNATIONAL TECHNOLOGY CORPORATION

NOTES:
1. DIMENSIONS ARE APPROXIMATE.
2. EACH SET OF AERATION EQUIPMENT INCLUDES:
   *MOISTURE SEPARATOR DRUM
   *FILTER
   *BLOWER
   *ACTIVATED CARBON DRUM
   *POLYETHYLENE TUBING
3. BUILDING DIMENSIONS ARE APPROXIMATELY 500' x 155'.

SCALE
0 60 120 FEET

HPB123SS (HP)

Activity ID	Early start	Early finish	Rem Dur
Preconstruction Activities			
09904017	15JUN98A	06JUL98	0
00103001	14AUG98A	21AUG98	3
00103008	14AUG98A	21AUG98	3
00103013	14AUG98A	21AUG98	3
00103014	14AUG98A	21AUG98	3
00103027	18AUG98A	21AUG98	3
00103026	24AUG98	21SEP98	20
A	24AUG98	21SEP98	20
B	22SEP98	28SEP98	5
00206000	29SEP98	29SEP98	1
00209007	30SEP98	13OCT98	10
00103091	19OCT98	19OCT98	1
Construction Activities			
C	20OCT98	21OCT98	2
00101000	21OCT98	21OCT98	1
00104005	22OCT98	22OCT98	1
01702000	22OCT98	23OCT98	2
01902001	26OCT98	02NOV98	6
01903001	26OCT98	03NOV98	7
02101005	03NOV98	03NOV98	1
02104000	04NOV98	04NOV98	1
D	04NOV98	04NOV98	1
Posticonstruction Activities			
02106006	05NOV98	22DEC98	32
09919090	05NOV98	01FEB99	58
Period of Performance			
P1	15JUL98A	04NOV98	55
P2	05NOV98	01FEB99	58*



Project Start	01JAN98
Project Finish	01FEB99
Data Date	19AUG98
Run Date	21AUG98

Early Bar
Progress Bar
Critical Activity

132B

Sheet 1 of 1

EFA WEST, HUNTERS POINT, DO132
SOIL REMOVAL FROM BLDG 123
PROJECT SCHEDULE

FIGURE 3

INTERNATIONAL TECHNOLOGY CORPORATION

CONTRACTOR QUALITY CONTROL PLAN
SOIL REMOVAL FROM BUILDING 123
HUNTERS POINT SHIPYARD
SAN FRANCISCO, CALIFORNIA

CONTRACT NO. N62474-93-D-2151
DELIVERY ORDER NUMBER 0132

Submitted to:

Department of the Navy
Engineering Field Activity West
Naval Facilities Engineering Command
900 Commodore Drive
San Bruno, California 94066-2402

Submitted by:

IT Corporation
4585 Pacheco Boulevard
Martinez, California 94553

Revision 0

September 1998

Issued to: Program Library Date: 9-30-98

Copy #: 07 ☒ Controlled ☐ Uncontrolled

CONTRACTOR QUALITY CONTROL PLAN
SOIL REMOVAL FROM BUILDING 123
HUNTERS POINT SHIPYARD
SAN FRANCISCO, CALIFORNIA

CONTRACT NO. N62474-93-D-2151
DELIVERY ORDER NUMBER 0132

Revision 0

September 1998

Approved by: _____ Date: 9-29-98
Thomas A. Davis
IT Program Contractor
Quality Control Manager

Approved by: _____ Date: 09.29.98
Dennis Julio, P.E.
IT Project Manager

Approved by: _____ Date: 09/29/98
Valerie Crooks, P.E.
IT Program Manager

1.0 Introduction

This Contractor Quality Control Plan (CQCP) has been prepared to describe those QC actions which will be implemented during the removal of soils from Building 123 at Hunters Point Shipyard, San Francisco, California.

The CQCP will be used in conjunction with the Program Contractor Quality Control Plan (PCQCP), Revision 2, and Standard Quality Procedures (SQP)/Standard Operating Procedures (SOP), as applicable and described below:

2.0 Program Contractor Quality Control Plan

Section 0.0 - Policy Statement; Applicable in its entirety

Section 1.0 - Introduction; Applicable in its entirety

Section 2.0 - Organization and Responsibilities; Applicable with the following modification:

As applicable to QC organization in Figure 1, Quality Control Organization Chart

Section 3.0 - Quality Control Management; Applicable with the following modification:

3.4: Change the word "biweekly" in the first sentence of paragraph 3.4 to read "weekly."

Section 4.0 - Personnel Training and Qualification; Applicable in its entirety

Section 5.0 - Instructions, Procedures and Drawings; Applicable in its entirety

Section 6.0 - Document Control; Applicable in its entirety

Section 7.0 - Procurement; Applicable in its entirety

Section 8.0 - Data Quality Objectives; Not applicable

Section 9.0 - Field Activities; Applicable with the following modification:

add to 9.3: QA/QC samples will be collected and analyzed as discussed in the Sampling and Analysis Plan.

add to 9.4.1: Samples collected and delivered to a laboratory within four hours of collection will be exempt from the temperature requirement providing all other collection and handling procedures were implemented.

Section 10.0 - Analytical Activities; Applicable in its entirety

Section 11.0 - Report Preparation; Applicable in its entirety

Section 12.0 - Review of Work Activities; Applicable in its entirety

Section 13.0 - Inspections; Applicable in its entirety

Section 14.0 - Calibration and Maintenance of Measuring and Test Equipment; Applicable in its entirety

Section 15.0 - Test Control; Applicable in its entirety

Section 16.0 - Nonconformance Control and Corrective Actions; Applicable in its entirety

Section 17.0 - Change Control; Applicable in its entirety

Section 18.0 - Audits and Surveillance; Applicable with the following modification:

delete subsections 18.1 through 18.8

Section 19.0 - Records Management; Applicable in its entirety

3.0 Procedures

3.1 Standard Quality Procedures

The following Standard Quality Procedures (SQP) have been determined to be applicable:

SQP 1.1 Contractor Quality Control Program
SQP 3.2 Indoctrination and Training
SQP 4.1 Document Control
SQP 4.2 Records Management
SQP 5.1 Preparation, Revision and Approval of Plans and Procedures
SQP 6.1 Preparation, Review and Approval of Procurement Documents

SQP 7.1 Quality Inspections and Inspection Records
SQP 7.2 Receipt Inspection
SQP 8.2 Calibration and Maintenance of Measuring and Test Equipment
SQP 10.1 Nonconformance Control
SQP 10.2 Corrective Action
SQP 10.3 Stop Work Order
SQP 11.1 Field Work Variance/Request For Information
SQP 12.1 Quality Audits
SQP 12.2 Management Assessment
SQP 12.3 Quality Surveillances
SQP 13.1 Coordination of Subcontracted Analytical Laboratories

3.2 Standard Operating Procedures

The following Standard Operating Procedures (SOP) have been determined to be applicable:

SOP 1.1 Chain of Custody
SOP 2.1 Sample Handling, Packaging and Shipping
SOP 3.1 Surface and Shallow Subsurface Soil Sampling
SOP 6.1 Sampling Equipment and Well Material Decontamination
SOP 17.1 Sample Labeling
SOP 17.2 Sample Numbering
SOP 18.1 Field QC Sampling
SOP 19.1 On-Site Sample Storage

4.0 Attachments

CQC Manager Designation Letter
CQC Manager Alternate Designation Letter
CQC Organization Chart
Definable Features of Work Matrix
Testing Plan and Log
Submittal Register

SOIL REMOVAL FROM BUILDING 123
HUNTERS POINT SHIPYARD
SAN FRANCISCO, CALIFORNIA

DELIVERY ORDER 0132

CQC MANAGER
LETTER OF DESIGNATION

September 29, 1998

Mr. Brooks Gaither:

This letter will serve to assign you as IT Corporation's site CQC Manager for the above captioned delivery order. In the case where you are not able to perform the CQC Manager's duties, Mr. Greg Martinez will serve as your alternate CQC Manager. In the role of CQC Manager you have the responsibilities and authorities designated in Section 2.1.3 of the Program Contractor Quality Control Plan, Revision 2. Additionally, you are granted Stop Work authority and will exercise this authority consistent with the Program CQC Plan, Section 16.4 and SQP 10.3. You are granted the authority to approve submittals which have been certified by qualified submittal reviewers as identified in the CQC organization chart for this delivery order and as necessary to ensure the quality of the work, and direct the removal and/or replacement of nonconforming materials or work. In this capacity you will report directly to me and will administer the established requirements of the delivery order CQC Plan.

If you have any questions or require additional information, please contact me at (925) 372-9100.

Sincerely,
IT CORPORATION

Thomas A Davis

Thomas A. Davis
Program CQC Manager

SOIL REMOVAL FROM BUILDING 123
HUNTERS POINT SHIPYARD
SAN FRANCISCO, CALIFORNIA

DELIVERY ORDER 0132

ALTERNATE CQC MANAGER
LETTER OF DESIGNATION

September 29, 1998

Mr. Greg Martinez:

This letter will serve to assign you as IT Corporation's alternate site CQC Manager for the above captioned delivery order. In the case where the designated CQC Manager, Mr. Brooks Gaither, is unable to perform the CQC Manager's duties, you will serve in that capacity. In this role, you will have the responsibilities and authorities designated in Sections 2.1.3 of the Program Contractor Quality Control Plan, Revision 2. Additionally, you will have Stop Work authority and will exercise this authority consistent with the Program CQC Plan, Section 16.4 and SQP 10.3. You are granted the authority to approve submittals which have been certified by qualified submittal reviewers as identified on the CQC Organization Chart for this delivery order and as necessary to ensure the quality of the work, and direct the removal and/or replacement of nonconforming materials or work. You will be authorized to act as an alternate for 14 consecutive working days or 30 nonconsecutive working days at a maximum. In the case where it is believed that these time periods will be exceeded, you must notify me so that I may arrange with EFA-West and the ROICC to have this position replaced. You will report directly to me and will administer the established requirements of the delivery order CQC Plan.

If you have any questions or require additional information, please contact the undersigned at (925) 372-9100.

Sincerely,
IT CORPORATION

Thomas A Davis

Thomas A. Davis
Program CQC Manager

DRAWN BY	SJZ	CHECKED BY	09-29-98	DRAWING NUMBER	775745-A1
	9-29-98	APPROVED BY			

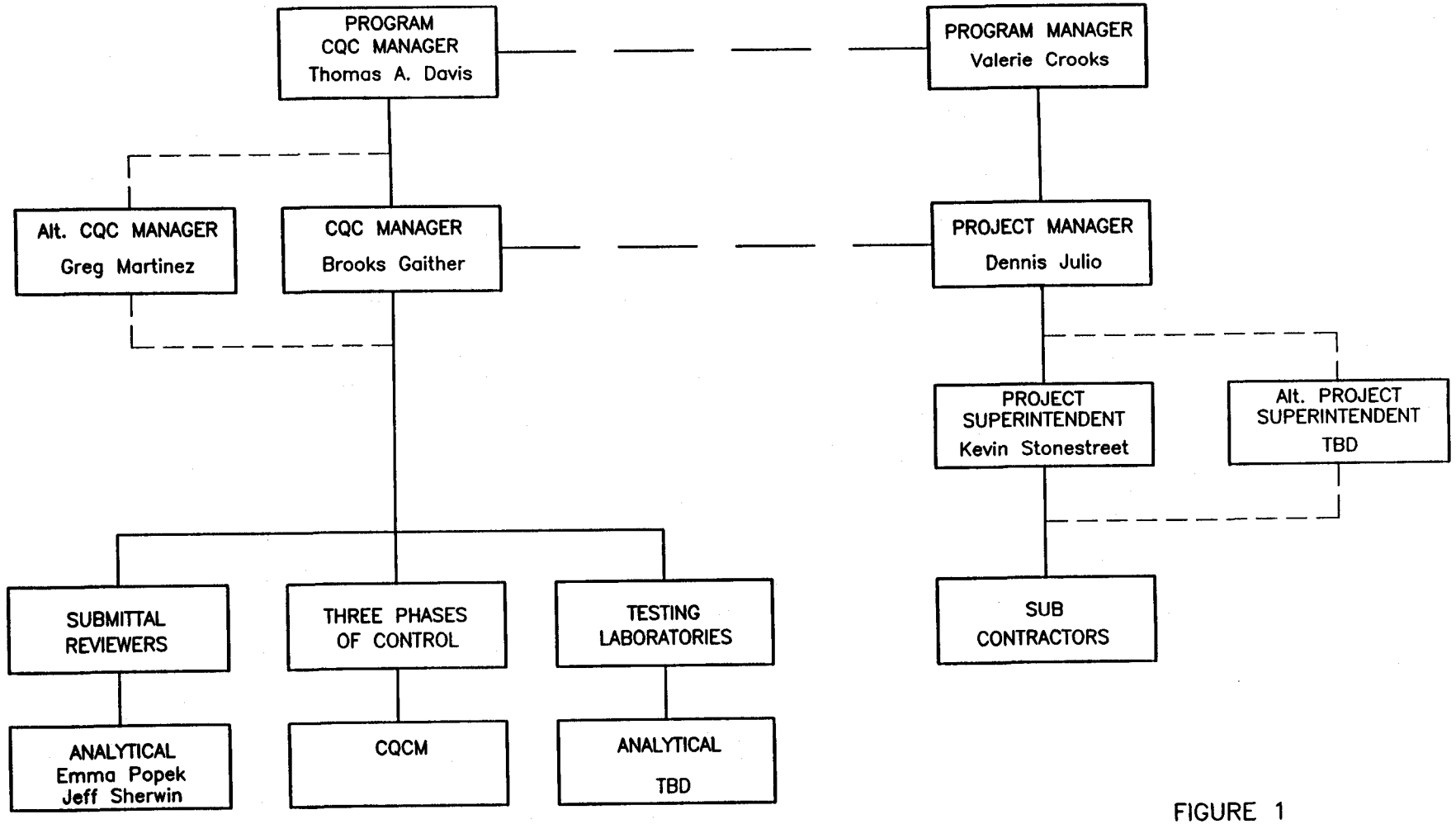


FIGURE 1

QUALITY CONTROL ORGANIZATIONAL CHART

SOIL REMOVAL FROM BUILDING 123
HUNTERS POINT SHIPYARD
DELIVERY ORDER #0132

PREPARED FOR

DEPARTMENT OF THE NAVY
EFA WEST

INTERNATIONAL TECHNOLOGY CORPORATION

HP-QC132(HP50)

SOIL REMOVAL FROM BUILDING 123
HUNTERS POINT SHIPYARD
SAN FRANCISCO, CALIFORNIA

DELIVERY ORDER No. 0132

DEFINABLE FEATURES OF WORK MATRIX

Spec. Section	Para. No.	Feature of Work	Prep		Initial		Follow up	Remarks
			Req	Date	Req	Date	Req	
Work Plan	2.3	Personnel and Equipment Decontamination Facilities	X		X		X	
Work Plan	2.5	Soil Sample Collection	X		X		X	
Work Plan	3.2, 4.0, 5.0	Soil Loading,Transportation and Disposal	X		X		X	

TESTING PLAN AND LOG

CONTRACT NO. N62474-93-D-2151 DELIVERY ORDER NO. 0132	PROJECT TITLE AND LOCATION SOIL REMOVAL FROM BUILDING 123 HUNTERS POINT SHIPYARD, SAN FRANCISCO, CALIFORNIA	CONTRACTOR IT Corporation

SPECIFICATION SECTION AND PARAGRAPH NUMBER	TEST PROCEDURE	TEST NAME	ACCREDITED/ APPROVED LAB YES NO	SAMPLED BY	LOCATION OF TEST ON OFF SITE SITE	FREQUENCY of TEST	DATE COMPLETE	DATE FORWARDED TO CONTR. OFF	REMARKS
*									

* No testing has been planned or scheduled for this Delivery Order.

SUBMITTAL REGISTER

CONTRACT NO.
N62474-93-D-2151
D.O. No. 0132

[redacted]E AND LOCATION
SOIL REMOVAL FROM BUILDING 123, HUNTERS POINT SHIPYARD, SAN FRANCISCO, CALIFORNIA

CONTRACTOR
IT Corporation

SPECIFICATION SECTION
Base Contract

TRANS-MITTAL NO. a	ITEM NO. b	SPECIFICATION PARAGRAPH NO. c	DESCRIPTION OF ITEM SUBMITTED d	TYPE OF SUBMITTAL										CLASSI-FICATION		REVIEWER p	CONTRACTOR SCHEDULE DATES			CONTRACTOR ACTION			GOVERNMENT ACTION		REMARKS[1] y
				DATA e	DRAWINGS f	INSTRUCTIONS g	SCHEDULES h	STATEMENTS i	REPORTS j	CERTIFICATES k	SAMPLES l	RECORDS m		INFORMATION ONLY n	GOVERNMENT APPROVED o		SUBMIT q	APPROVAL NEEDED BY r	MATERIAL NEEDED BY s	CODE t	DATE u	SUBMIT TO GOVERN-MENT v	CODE w	DATE x	
	001	2.1/6.14.5	As-Built Record - Drwg.		X									X											Not required for this D.O.
	002	3.2.2	Site Health and Safety Plan					X						X						A	8-24-98	yes			Submit 15 days after D.O. award
	003	4.3.1/4.4.1	Environmental Protection Plan					X							X					A	8-24-98	yes			Submit 15 days after D.O. award
	004	4.3.1/4.4.2	Environmental Conditions Report						X						X										Submit 15 days after D.O. award
	005	6.3.1.1/7.3.1	CQC Plan w/Submittal Register					X							X					A	8-24-98	yes			Submit 15 days after D.O. award
	006	5.4.1	Work Plan					X							X					A	8-24-98	yes			Submit 15 days after D.O. award

[1]Days are based on five-day work week.

[redacted]

SUBMITTAL REGISTER

CONTRACT NO.
N62474-93-D-2151
D.O. No. 0132

[redacted]E AND LOCATION

SOIL REMOVAL FROM BUILDING 123, HUNTERS POINT SHIPYARD, SAN FRANCISCO, CALIFORNIA

CONTRACTOR

IT Corporation

SPECIFICATION SECTION
Scope of Work

TRANSMITTAL NO. a	ITEM NO. b	SPECIFICATION PARAGRAPH NO. c	DESCRIPTION OF ITEM SUBMITTED d	TYPE OF SUBMITTAL										CLASSIFICATION		REVIEWER p	CONTRACTOR SCHEDULE DATES			CONTRACTOR ACTION			GOVERNMENT ACTION		REMARKS[1] y
				DATA e	DRAWINGS f	INSTRUCTIONS g	SCHEDULES h	STATEMENTS i	REPORTS j	CERTIFICATES k	SAMPLES l	RECORDS m		INFORMATION ONLY n	GOVERNMENT APPROVED o		SUBMIT q	APPROVAL NEEDED BY r	MATERIAL NEEDED BY s	CODE t	DATE u	SUBMIT TO GOVERNMENT v	CODE w	DATE x	
[redacted]	001	E.	Implementation Report																						Submit 45 days after completion of D.O.

[1]Days are based on five-day work week.

[redacted]

SAMPLING AND ANALYSIS PLAN
SOIL REMOVAL FROM BUILDING 123
HUNTERS POINT SHIPYARD
SAN FRANCISCO, CALIFORNIA

Contract No. N62474-93-D-2151
Delivery Order No. 0132

Submitted to:

Department of the Navy
Engineering Field Activity, West
Naval Facilities Engineering Command
900 Commodore Drive
San Bruno, California 94066-2402

Submitted by:

IT Corporation
4585 Pacheco Boulevard
Martinez, California 94553

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September 1998

Issued to: Program Library Date: 9-30-98

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SAMPLING AND ANALYSIS PLAN
SOIL REMOVAL FROM BUILDING 123
HUNTERS POINT SHIPYARD
SAN FRANCISCO, CALIFORNIA

Contract No. N62474-93-D-2151
Delivery Order No. 0132

Revision 0

September 1998

Approved by: _____ Date: 9-29-98
Emma P. Popek
IT Program Chemist

Approved by: _____ Date: 9-30-98
Thomas A. Davis
IT Program Contractor Quality
Control Manager

Approved by: _____ Date: 09.29.98
Dennis R. Julio, PE.
IT Project Manager

Approved by: _____ Date: 09/29/98
Valerie Crooks, P.E.
IT Program Manager

Table of Contents

1.0 Site Background

Hunters Point Shipyard (HPS) is located in southeastern San Francisco and includes 936 acres, of which 493 are composed of land above the high tide line of San Francisco Bay and 443 are below the waters of the bay. The U.S. Government received title to the land at HPS in 1940. This property was developed and used as a shipyard for repair of Navy vessels from 1945 to 1974. HPS was deactivated in 1974 and was largely in disuse until 1976. From 1976 to 1986 parts of HPS were leased to various private users. The Navy resumed occupancy of the property in 1986 and the facility was in use by the Navy until 1994.

Building 123 is located on Lockwood Street (at the northern end of the shipyard) and covers an area of approximately 500 feet by 150 feet. The building is situated on Installation Restoration (IR) Site 10, within Parcel B. The soil stockpiled within Building 123 was initially excavated from the Tank Farm (IR Site 6) at HPS, and includes the remains of a bioremediation pilot study conducted by the Navy Public Works Center - San Francisco Bay Area (PWC - SFBA) and CH2M Hill. The study was discontinued in early 1997. D.O. 132 continues the work begun under D.O. 0006, Modification 11.

The primary sources of contamination at the Tank Farm where the soil was excavated from were spills from the tanks used by the Navy to store diesel fuel, lubrication oil, and possibly Stoddard solvent. The primary chemicals of concern (COCs) are petroleum hydrocarbons, lead, arsenic, beryllium, and manganese.

The soil within Building 123 is currently segregated into four square, prismoidal stockpiles, each with approximate base dimensions of 65 feet by 65 feet and top dimensions of 25 feet by 25 feet. The stockpiles cover a total length of approximately 350 feet, with an average height of approximately 9 feet. The combined volume of the stockpiles is 3,200 cubic yards (yd^3). The stockpiles are uncovered and resting on the concrete floor of the building.

The soil stockpiled within Building 123 will be characterized for disposal at Class II Forward Landfill in Manteca, California.

2.0 Sampling Objectives

The sampling and analysis objectives are to determine if the soil stockpiled within Building 123 meets the landfill acceptance criteria. After the soil is characterized and has met the acceptance criteria, listed in Tables 1 and 2, it will be profiled and disposed of at the Forward Landfill.

Table 1
Acceptance Limits for Metals

Elements	Title 22[1] STLC, mg/L	Title 22 TTLC, mg/kg
Arsenic	5	600
Beryllium	0.75	75
Cadmium	1	100
Chromium	560	2,500
Lead	5	1,000
Nickel	20	2,000
Zinc	250	5,000

STLC = Soluble Threshold Limit Concentration
TTLC = Total Threshold Limit Concentration
[1] California Code of Regulations, 1991

Table 2
Acceptance Limits for Organic Contaminants

Contaminant	Concentration
Gasoline	No fixed limit
Diesel	No fixed limit
Oil	No fixed limit
Benzene	0.5 mg/L TCLP
Toluene	No fixed limit
Ethyl benzene	No fixed limit
Xylene	No fixed limit

TCLP = Toxicity Characteristic Leaching Procedure

All sampling activities will be performed in accordance with Section 9 of the Program Contractor Quality Control Plan (PCQCP) for Environmental Remedial Actions, Revision 2, September 1996.

The analytical data will be reviewed by the project manager and designated technical personnel to determine proper management of the generated wastes. This data will be available to the Navy, regulatory agencies and the landfill personnel.

Since results of the sampling and analysis will be used to determine the ultimate disposition of the generated waste, definitive (as opposed to screening) data are required. Only a Naval Facilities Engineering Support Center (NFESC) approved analytical laboratory will be subcontracted to perform the required analyses. Analytical results will require a standard turnaround time. Analytical results for waste characterization samples will be submitted to IT in a standard laboratory report. These deliverables are described in Section C.1, Tasks 6.0, 7.0, 8.0 and 9.0 of IT's Navy RAC Analytical Services subcontract, Feb. 1995.

3.0 Analytical Requirements

Site information, including figures and location map of the stockpiles, are included in the project work plan.

3.1 Stockpile Soil Samples

Representative samples are required for wastes intended for off-site disposal. A four-point composite (four individual grab samples composited at the laboratory into one sample) generally satisfies the requirements for representativeness. The individual grab samples will be collected at evenly distributed locations at a depth of at least six inches to two feet within the stockpile to be characterized. One composite sample will be collected and analyzed per stockpile. A total of four soil samples will be collected and analyzed for waste characterization.

The project analytical requirements are presented in Table 3. According to the landfill's profiling requirements, samples will be analyzed for volatile organic compounds (VOCs), including benzene, toluene, ethyl benzene and xylenes (BTEX), by EPA Method 8260, total recoverable petroleum hydrocarbons (TRPH) by EPA Method 418.1, total petroleum

Table 3
Project Analytical Requirements

Analytical Parameter	Analytical Method	Estimated Number of Field Samples
Volatile Organic Compounds	EPA[1] 8260	4
TPH as Gasoline	EPA 8015	4
TPH as Diesel	EPA 8015	4
Total Recoverable Petroleum Hydrocarbons (TRPH)	EPA 418.1	4
Total Metals (cadmium, chromium, lead, nickel, zinc, arsenic, and beryllium)	EPA 6010	4
CA Wet Extraction (WET) for STLC chromium	CA WET[2]/EPA 6010	Up to 4
TCLP for benzene	EPA 1311/8260	Up to 4
Fish bioassay	96 Hour Acute Aquatic LC_{50}	Up to 4

[1] Test Methods for Evaluating Solid Waste (SW-846), December 1996.
[2] California Code of Regulations, 1991.

hydrocarbons (TPH) as gasoline and diesel by EPA Method 8015, and California Assessment Metals (CAM 17) by EPA Method 6010. According to the requirements of Forward Landfill acceptance procedure and based on the nature of contaminants of concern, the metals will include cadmium, chromium, lead, nickel, zinc, arsenic, and beryllium. If the total concentration of any of these metals, with the exception of chromium, exceeds the soluble concentration listed in Table 1 by a factor of 10, additional Soluble Threshold Limit Concentration (STLC) analysis for this method will be conducted. If a total chromium concentration is equal or exceeds 100 mg/kg, the STLC analysis will be conducted.

To meet the Toxic Characteristic Leaching Procedure (TCLP) acceptance criterion for benzene, total benzene concentrations will be compared with the acceptance limit listed in Table 2. If a total benzene concentration exceeds 10 mg/kg, additional TCLP analysis will be conducted.

A 96 Hour Acute Aquatic LC_{50} fish bioassay may be also required for soil with the following TPH concentrations:

- gasoline ≥5,900 mg/kg
- diesel ≥20,000 mg/kg
- motor ≥10,000 mg/kg

A two week turnaround time will be required for the analytical results based on the project schedule. Quantitation limits for each analyte of interest will be in accordance with the method's requirements specified in SW-846. All methods will be performed in accordance with IT's Statement of Work, Navy RAC Analytical Services Subcontract, February 1995.

3.2 QC Samples

The need for field QC samples and their types are defined by the data quality objectives for this project. Soil samples will be collected and analyzed for the purpose of waste profiling, and the analytical results will be compared to the landfill's acceptance limits, presented in Tables 1 and 2. The VOC acceptance criteria are not defined by the landfill, and based on the allowable levels of petroleum hydrocarbons they can be expected to be much higher than possible ambient or cross-contamination levels. Therefore, there is no need to analyze a trip blank for this project.

Soil samples will be collected with disposable sampling equipment, eliminating a need for rinsate blanks. The intended use of the data does not justify collection of field duplicates or additional soil aliquot for laboratory matrix spikes.

A temperature blank (a 40ml vial filled with water) will be included in each cooler with field samples.

4.0 Sample Designation

Samples will be uniquely designated utilizing the delivery order number as a prefix using the following numbering system: the four stockpiles will be numbered 1 through 4 and shown on as-built drawings. Samples from stockpile 1 will be labeled 132-SP1-001 through -004. The remaining samples will utilize the same prefix and suffix designations, only the middle sample designation will change to -SP2-, -SP3-, and -SP4-.

Sample numbers will be documented and sample containers labeled in accordance with IT Standard Operating Procedures (SOPs) 17.1 and 17.2. The following information at a minimum will be included on the sample label: project number, sample number, collection date and time, and sample preservative (if applicable). The sample collection log, in addition to the above information, will include the collector's name, a detailed description of sample location (including depth) and sample type.

5.0 Sampling Equipment and Procedures

Soil samples will be collected from the stockpiles using a shovel, a trowel, or a disposable plastic scoop as described in IT SOP 3.1. The sample container will be completely filled so that little or no headspace exists.

6.0 Sample Handling

Sample containers, preservatives and holding times will be observed as indicated in Table 4. The sample chain of custody will be implemented in accordance with IT SOP 1.1. Samples will be packaged and placed in coolers with ice for shipment to the laboratory according to IT SOP 2.1.

Custody tape will be placed over or around each sample container cap. Each container will then be placed in a separate, seam-sealing plastic bag. A combination of absorbent packaging material and foam or plastic packaging material will be used to securely pack samples in the cooler prior to shipment to the laboratory. Sufficient ice will be included (sealed in double, heavy-duty plastic bags) to maintain the cooler at 4° C $\pm 2^{\circ}$ C.

Table 4
Requirements for Sample Containers, Preservation, and Holding Time

Analytical Method	Sample Container	Preservation	Holding Time
EPA 8260	8 ounce glass jar with Teflon-lined lid	2-6°C	14 days
EPA 1311/8260			14 days to extraction, 14 days after extraction to analysis
EPA 8015	8 ounce glass jar with Teflon-lined lid	2-6°C	14 days
EPA 418.1			28 days
EPA 6010	8 ounce glass jar with Teflon-lined lid	2-6°C	6 months
CA WET/EPA 6010			6 months
96 Hour Acute Aquatic LC_{50}	8 ounce glass jar with Teflon-lined lid	2-6°C	No holding time assigned

HEALTH AND SAFETY PLAN
SOIL REMOVAL FROM BUILDING 123
HUNTERS POINT SHIPYARD
SAN FRANCISCO, CALIFORNIA

CONTRACT NO. N62474-93-D-2151
DELIVERY ORDER NUMBER 0132

Submitted to:

Department of the Navy
Engineering Field Activity West
Naval Facilities Engineering Command
900 Commodore Drive
San Bruno, California 94066-2402

Submitted by:

IT Corporation
4585 Pacheco Boulevard
Martinez, California 94553

Revision 0

September 1998

Issued to: Program Library Date: 9-30-98

Copy #: 07 ☒ Controlled ☐ Uncontrolled

IT CORPORATION - HEALTH AND SAFETY PLAN, REV 0

PROJECT NAME: **Delivery Order 132, Soil Removal From Building 123 Hunters Point Shipyard, San Francisco, California**

CLIENT NAME: **Department of the Navy, Engineering Field Activity, West, Naval Facilities Engineering Command**

CLIENT ADDRESS: **900 Commodore Drive, San Bruno, CA 94066-2402**

CLIENT CONTACT: J. Finnegan **PHONE: (650) 244-2554**

PROPOSED START DATE: 10/02/98 **PROPOSED DURATION: 6 weeks**

LOCATION: **Building 123, Hunters Point Shipyard, San Francisco, CA**

APPLICABILITY: IT Corporation (IT) has been contracted by the United States Department of the Navy, Engineering Field Activity, West (EFA West) to remove and dispose approximately 3,200 cubic years (yd^3) of soil and remove and stockpile bioremediation equipment from Building 123 at Hunters Point Shipyard (HPS), San Francisco, California.

The above project/tasks are the only activities covered by this abbreviated Health and Safety Plan. Should additional activites be required to complete this project, modifications to this Health and Safety Plan will be required.

REQUIRED REVIEW:
SIGNATURE: _____ DATE: 09.29.98
Project Manager - Dennis Julio, P.E.

SIGNATURE: _____ DATE: 09/29/98
Program Manager - Valerie Crooks, P.E.

APPROVAL SIGNATURE: _____ DATE: 9/28/98
Program CIH - William Hetrick, C.I.H.

THE AMERICAN BOARD OF INDUSTRIAL HYGIENE INCORPORATED CERT. NO 1105 EXPIRES 12-31-1998 PENNSYLVANIA 1969 WILLIAM J. HETRICK, CIH

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List of Tables

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List of Appendices

Site Health and Safety Plan Acknowledgment

I understand and agree to abide by the provisions as detailed in this Site Health and Safety Plan (SHSP) for the activities described in the Project Work Plans. Failure to comply with these provisions may lead to disciplinary action which may include dismissal from the work site, termination of employment or, for subcontractors, termination of the work contract.

Printed Name	Company	Signature	Date

Proposition 65 Warning and Notification

As required under the Safe Drinking Water and Toxic Enforcement Act of 1986 (also known as Proposition 65), on February 27, 1987, the Governor published a listing of those chemicals determined by the State of California to cause cancer, birth defects, or other reproductive harm. Proposition 65 requires that businesses that handle any of the listed chemicals notify people in the affected area of that fact. IT Corporation handles some of the listed chemicals at the Hunters Point Shipyard in San Francisco, California.

The chemicals present on site that have been determined to cause cancer include:

- Arsenic
- Beryllium
- Lead
- PAHs

The following contaminants on site have been determined by the State to cause reproductive harm:

- Arsenic
- Lead
- PCBs

1.0 Introduction

1.1 Objective

The objective of this Site Health and Safety Plan (SHSP) is to ensure that safe working conditions exist during this project. The safety procedures outlined have been established based on preliminary analysis of potential hazards within the site. This SHSP describes the health and safety requirements and procedures to be used while conducting field work. This document is required by IT Policies and Procedures, OSHA 29 CFR 1910 and 1926 (in California by Title 8 California Code of Regulations, T8CCR) and USACE EM 385-1-1. This document, in combination with IT's Corporate Health and Safety Policy and Procedures Manual, also serves as the company's Injury and Illness Prevention Plan (IIPP) and Code of Safe Work Practices. Safety takes precedence over expediency or shortcuts. Every reasonable step to reduce the possibility of injury, illness, or accident will be taken. **NOTE**: This SHSP is not designed to be used for operations involving Immediately Dangerous to Life or Health (IDLH) or confined space entry.

2.0 Responsibilities

Each person is responsible for their own health and safety, for completing tasks in a safe manner and for reporting any unsafe acts or conditions to their supervisor and the Project Superintendent (PS). All persons on-site are responsible for continuous adherence to health and safety procedures during the performance of any project work. In no case may work be performed in a manner which conflicts with the intent of, or the inherent safety precautions expressed in this SHSP. After due warning, persons who violate procedures and work rules may be dismissed from the site, terminated, or have their contract revoked. Blatant disregard or repeated infractions of health and safety policies are grounds for disciplinary action up to and including dismissal, and /or removal from the work area. For specific staff responsibilities refer to either IT Policies and Procedures Manual or the Program/Project SHSP. All IT and subcontractor personnel are required to read and acknowledge their understanding of this abbreviated SHSP.

2.1 Project Staffing

PROJECT MANAGER: Dennis Julio, P.E.

PROJECT SUPERINTENDENT: Kevin Stonestreet

SITE HEALTH AND SAFETY OFFICER: Jim Wright

2.2 Subcontractors

Company: S&S Trucking

Contact Name: Frank Sanchez **Phone:** (415) 626-1123

Address: 1335 Sixth St.; San Francisco, CA 94107

Scope of work: Transportation and Disposal of Soil

Training Required: Commercial Drivers License

Contractor Pre-qualified? (✓) **Yes** ( ) **No**

Company: DenBeste Transportation, Inc.

Contact Name: Lori Denbeste **Phone:** (707) 838-1407

Address: 930 Shiloh Road, Windsor, CA 95492

Scope of work: Transportation and Disposal of Soil

Training Required: Commercial Drivers License

Contractor Pre-qualified? (✓) **Yes** ( ) **No**

3.0 Project Hazard Analysis

3.1 Scope Of Work and Site Description

Hunters Point Shipyard (HPS) is a 936 acre military complex situated in the southeastern edge of the City and County of San Francisco, on a peninsula extending east into San Francisco Bay. Approximately 493 acres of the facility lie above the high tide line of the San Francisco Bay.

After receiving the title of HPS in 1940, the federal government developed and operated Naval facilities until deactivated in 1974. Portions of the facility were leased for commercial use from 1976 to 1986 at which time the Navy resumed occupancy for use until 1994. In 1989, HPS was placed on the National Priorities List (NPL) pursuant to the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA). The Defense Base Realignment and Closure Act of 1990 (Public Law 101-510) initiated the closure of activities to make the property available for nondefense use.

Building 123 is located on Lockwood Street (at the northern end of the shipyard) and covers an area of approximately 500 feet by 150 feet. The soil stockpiled within Building 123 was initially excavated form the Tank Farm at HPS, and includes the remains of a bioremediation pilot study conducted by the Navy Public Works Center.

The primary sources of contamination at the Tank Farm where the soil was excavated from were spills from the tanks used by the Navy to store diesel fuel, lubrication oil, and possibly Stoddard solvents. The primary chemical of concern (COCs) are polychlorinated biphenyls (PCBs), polyaromatic hydrocarbons (PAHs), lead, arsenic, beryllium, and manganese. Material Safety Data Sheets for COCs are located in Appendix A.

The primary objectives of the project are to, sample and dispose the soil located in Building 123, dispose the carbon absorption drums, and stockpile the aeration equipment in the south portion of Building 123.

Several preparatory and support activities are involved with these construction activities including installing personnel and equipment decontamination facilities, shutting down electrical power for the building, and performing the necessary analytical testing required for the project. The general approach will be to load the soil into trucks for subsequent transport to a Navy-approved off-site disposal facility.

The following tasks are to be performed during this project:

- Mobilization
- Site preparation
- Lockout/tagout of electrical sources
- Soil sampling

- Soil removal
- Remove and dispose of carbon absorption drums
- Remove and stockpile of aeration equipment
- Equipment decontamination.

EMERGENCY RESPONSE

[✓] **NO**

[ ] **YES**
{If exposure is expected to be greater than 50% of the action level for the contaminants on site, this SHSP must be augmented with a more detailed chemical hazard analysis}

OPERATION WITHIN THE SCOPE OF HAZARDOUS WASTE OPERATIONS?

[ ] **NO**

[✓] **YES**
{If exposure is expected to be greater than 50% of the action level for the contaminants on site, this SHSP must be augmented with a more detailed chemical hazard analysis}

3.2 Physical Hazards

Physical hazards which may be encountered during the course of this project include: vehicle traffic, heavy equipment, pressure washing electrical power hand tools, power tools, work from elevated locations, lifting of equipment, heat stress, noise, dust, and slips, trips and falls. Specific hazards will be covered prior to work activities in the tailgate safety meeting.

Activity Hazard Analysis for each major task are located in Appendix B.

3.3 Material Handling Equipment

The following equipment may be used on this project:

- Rubber-tired front-end loader
- Rubber-tired backhoe
- Water truck
- Power sweeper
- Water collection tanks

3.4 Chemical Contaminants and Concentrations in Soil / Water

Chemical	Concentration (PPM) Soil/Water	OSHA PEL/STEL
Polychlorinated Biphenyls	unknown * /soil	.5 mg/m^3/NA
Polyaromatic Hydrocarbons	unknown * /soil	.2 mg/m^3/NA
Lead	unknown * /soil	.05 mg/m^3/NA
Arsenic	unknown * /soil	.01 mg/m^3/NA
Beryllium	unknown * /soil	.002 mg/m^3/.005 mg/m^3
Manganese	unknown * /soil	5 mg/m^3/5 mg/m^3

* Actual concentrations of this contaminant in soil is not known. Sampling and analysis of the stockpiled soil is one of the objectives of this project. After review of analytical results modifications to this plan may be made, if required.

{If exposure is expected to be greater than 50% of the action level for the contaminants on site, this SHSP must be augmented with a more detailed chemical hazard analysis}

Due to work inside Building 123 requiring a front end loader, monitoring will be conducted for carbon monoxide and sulfur dioxide (potential exposure due to vehicle exhaust). If action level criteria are exceeded as stated in Section 8.1, work practices, ventilation, upgraded respiratory protection and additional monitoring will be specified by the Program CIH.

3.5 Shifts to be Worked

NUMBER OF SHIFTS: 1

SHIFT HOURS: 0600 **to** 1600

4.0 Buddy System

During this project, all employees shall be organized into work groups so as not to have any employee out of communication with another. Each employee in a work group shall be observed by at least one other person. The purpose of this buddy system is to provide those employees

with assistance when needed. Assignment of designated partners should take place during the Tailgate Safety Meeting.

The responsibilities of the buddy are to:

- Provide assistance if needed;
- Maintain line of sight contact or verbal contact with the assigned worker;
- Observe for signs of physical or mental impairment such as physical trauma or heat/cold stress; and
- Notify the SHSO if emergency help is needed.

5.0 Personal Protective Equipment

Work under this abbreviated SHSP will be conducted in levels of personal protection as defined by EPA's terminology for Personal Protective Equipment (PPE). These levels range from Level D, normal street clothes, to Level A, which requires supplied-air and a fully-encapsulating suit. For this project, work under this SHSP involving sampling of soil, removal of soil, removal of equipment, and equipment decontamination will be conducted in Level Modified Level D PPE. All other activities will be conducted in Level D. Any change in PPE will require the review and approval of the Program CIH.

5.1 Level D Protection

Level D PPE shall be used when:

- Work functions preclude splashes, immersions inhalation or contact with harmful chemicals.
- Atmospheric concentrations of contaminants are less than one-half of the TLV/PEL.

Level D PPE shall consist of:

- Standard work uniform or coveralls
- Steel-toed work boots, ANSI approved
- Safety glasses/goggles, ANSI approved
- Hearing protection (for sound levels over 85 dBA) 25 dBA or greater protection
- Splash shield (if necessary, but not to replace safety glasses/goggles)
- Hard-hat, ANSI approved
- Leather palm gloves (if necessary)

If working in the rain/snow or other wet conditions, rubber over booties/boots or steel-toed rubber boots may be substituted for steel-toed work boots. Poly-coated tyvek or rain suits may be worn, but only to protect from the weather, not as modified Level D.

5.2 Modified Level D

Modified Level D consists of level D plus:

- Steel-toed PVC* boots - if liquids are encountered, ANSI approved
- Tyvek* coveralls with hoods and elastic wrists and ankles
- Latex or Nitrile gloves (inner) - if liquids encountered
- Nitrile* gloves (outer) - if liquids are encountered
- Rain gear or poly-coated tyvek* (pressure washing activities)
- Metatarsal guards (pressure washing activities)

* Or constructed of other materials as appropriate

Openings in the PPE (i.e. ankles, wrists, zippers, etc) will be duct taped to seal the opening.

5.3 Level C Protection

Level C protection shall be used when:

- The types of air contaminants have been identified, concentrations have been measured, and an air-purifying respirator cartridge is available that can remove the contaminants.

- Oxygen is between 20% and 23.5% and the lower explosive limit (LEL) is less than 10%

- The substance has adequate warning properties.

Level C protection shall consist of Modified Level D PPE plus:

- Half-face or full-face air-purifying respirator with NIOSH approved cartridges listed for the contaminants expected to be encountered.

5.4 Level B Protection

Level B protection is required when airborne concentrations of hazardous materials exceed or are expected to exceed twice the OSHA permissible exposure limit (PEL). The equipment listed for Level C will be used for Level B protection except a full-face, pressure demand, supplied-air respirator will be substituted for the air-purifying respirator worn in Level C.

6.0 Site Control

6.1 Site Control

This project as well as all IT worksites requires that access to the site be controlled to protect both the worker and the public. This access control may require fences, barricades, traffic control devices, use of flaggers, caution tape and other methods to keep the site secure and provide a visual barrier to help keep the curious or unaware public from entering the site. For sites which include hazardous waste operations, the work area will be divided into three work zones based on the exposure to contaminated materials or anticipated hazards associated with the work; an exclusion zone (EZ), a contamination reduction zone (CRZ), and a support zone (SZ).

Only personnel who have completed the OSHA defined 40 hour health and safety training for hazardous waste operations and are current in their refresher training, may enter the EZ or CRZ. In addition, these personnel must have from an occupational medicine physician within the last 12 months, a specific medical clearance to work in hazardous waste operations.

6.2 Hazard Briefing

No person will be allowed on the site during site operations without first being given a site hazard briefing. In general, the briefing will consist of a review of the tailgate safety meeting. All persons on the site, including visitors, must sign the site-specific tailgate safety meeting form. Tailgate safety meetings shall be held daily, involving all personnel on site.

6.3 Entry Log

A site entry/exit log will be maintained with the names of all personnel who enter the CRZ or EZ.

6.4 Emergency Entry and Exit

The site location, evacuation routes, and emergency equipment locations will be included on a site map prior to the initiation of on-site activities. During an emergency, the evacuation routes noted on the site map should be followed. If conditions such as wind direction or physical hazards do not allow access to the prescribed evacuation routes, evacuate by the safest route available.

7.0 Decontamination

In general, everything that enters an EZ or CRZ must be either be decontaminated or properly discarded upon exit from the EZ or CRZ, All personnel must enter and exit the EZ through a CRZ. Prior to movement from the EZ, contaminated equipment will be decontaminated and then inspected by the SHSO before it is moved into the SZ.

The equipment decontamination area will be used to remove soil or material from all equipment leaving the work area. Decontamination procedures will consist of washing equipment to remove soil and/or material.

Personnel decontamination facilities will be established by IT on site to ensure that personnel maintain a high degree of personal hygiene and minimize the possibility of exposure to chemical hazards. All personnel exiting the EZ will pass through the decontamination area to remove gross contamination. Personnel are required to wash hands, face, and other exposed skin areas prior to leaving the CRZ for breaks or lunch.

8.0 Site Monitoring

8.1 Air Monitoring

Air monitoring is essential to ensure that all field personnel are adequately protected from airborne contaminants. The expected contaminants and the instruments to measure them are listed below:

ORGANIC VAPORS	[✓] PID	[	] FID
DUST EMISSIONS	[✓] Mini Ram	[	] Sampling Pump
OXYGEN/LEL	[✓] O_2/LEL Meter		
SPECIFIC CONTAMINANTS	[✓] CO and SO_2 Detectors		

Air Monitoring Frequency and Location

WORK ACTIVITY	INSTRUMENT	FREQUENCY[1]	LOCATION
Task 1			
Mobilization	PID or FID Miniram O2/LEL CO and SO_2 Detector	N/A N/A N/A N/A	N./A
Task 2			
Site Preparation	PID Miniram O2/LEL CO and SO_2 Detector	N/A N/A N/A N/A	N./A
Task 3			
Lockout/Tagout of Electrical Sources	PID Miniram O2/LEL CO and SO_2 Detector	N/A N/A N/A N/A	N./A
Task 4			
Soil Sampling	PID Miniram O2/LEL CO and SO_2 Detector	Periodically Periodically Continuously N/A	BZ of employee BZ of employee General area N/A
Task 5			
Soil Removal	PID Miniram O2/LEL CO and SO_2 Detector	Periodically Continuously Continuously Continuously	BZ of employee area/BZ of employee area/BZ of employee area/BZ of employee
Task 6			
Removal and Disposal of Carbon Absorption Drums	PID Miniram O2/LEL CO and SO_2 Detector	Periodically Periodically Continuous Continuous	BZ of employee area BZ of employee area
Task 7			
Removal and Stockpiling of Aeration Equipment	PID Miniram O2/LEL CO and SO_2 Detector	Periodically Periodically Continuous Continuous	BZ of employee BZ of employee area area
Task 8			
Equipment Decontamination	PID Miniram O2/LEL CO and SO_2 Detector	Periodically N/A N/A N/A	BZ of employee N/A N/A N/A

1 Frequency of air monitoring may be adjusted by the CIH after sufficient characterization of site conditions has been completed. Periodic is defined as at least once an hour unless sampling data demonstrates a less frequent monitoring schedule is justified

Action Levels

When in Level D PPE

Analyte	Action Level[1]	Required Action[2]
Dust	≥ .5 mg/m^3 above background	Upgrade to Level C
Unknown VOCs	> 5 ppm above background	Detector tube for Benzene. continue work if no Benzene detected
Benzene	> 1 ppm ≤ 5 ppm	Upgrade to Level C
	> 5 ppm	Stop work; contact CIH[3]
O_2	≥ 23.5% or ≤ 20%	Stop work; determine cause[3]
LEL	≥ 10% of LEL	Stop work; determine cause[3]
CO	> 25 ppm	Stop work; contact CIH to determine if Level B is required
SO_2	> 2 ppm ≤ 5 ppm	Upgrade to Level C

When in Level C PPE

Analyte	Action Level[1]	Required Action[2]
Dust	≥ 5.0 mg/m^3 above background	Stop work; initiate dust suppression[3]
Unknown VOCs	≥ 50 ppm above background in breathing zone (BZ)	Stop work; detector tube for benzene; if no benzene continue in Level C[3]
Benzene	> 5 ppm ≤ 50 ppm	Upgrade to Level B, contact CIH[3]
O_2	≥ 23.5% or ≤ 20%	Stop work; determine cause[3]
LEL	≥ 10% of LEL	Stop work; determine cause[3]
CO	> 25 pm	Stop work; contact CIH to determine if Level B is required
SO_2	> 5 ppm	Stop work; contact CIH to determine if Level B is required

When in Level B PPE

Analyte	Action Level[1]	Required Action[2]
Unknown VOCs	≥ 100 ppm above background in BZ	Stop work; detector tube for benzene; contact CIH[3]
O_2	≥ 23.5% or ≤ 20%	Stop work; determine cause[3]
LEL	≥ 10% of LEL	Stop work; determine cause[3]
CO	> 25 ppm	Continue Level B; contact CIH
SO_2	> 5 ppm	Continue Level B; contact CIH

[1] Five excursions above the action level in any 15 minute period or a sustained reading in excess of the action levels for 5 minutes will trigger a response.

[2] Frequency of air monitoring may be adjusted by the CIH after sufficient characterization of site contaminants has been completed, tasks are modified or site controls have proven effective.

[3] Contact with the Program CIH must be made prior to continuance of work. The Program CIH may then initiate integrated air sampling along with additional engineering controls.

No one is permitted to downgrade levels of PPE without authorization from the Program CIH.

8.2 Monitoring of Physical Hazards

The monitoring of physical hazards such as noise, temperature, wind speed, and dust may be performed by the SHSO under the direction of the Program CIH.

High noise levels are considered to be noise levels which make normal conversation difficult to understand at arm's length. This equates to a noise level of approximately 85 dBA.

Temperature shall be monitored by the SHSO. When temperatures on site exceed 85° F, heat stress monitoring shall be initiated. Heat stress monitoring shall consist of determination of Wet Bulb Globe Temperature (WBGT) and physiologic monitoring which may consist of pulse rate and/or body temperature determinations. Cold stress monitoring shall be initiated with the air temperatures drop below 45° F for an extended period of time during working hours. An extended period of time is defined for two continuous hours or more or a total of 3.5 hours during a work shift. Physiologic monitoring which shall consist of taking the body temperature will be initiated. The core body is not to drop below 96.8° F. Lower body temperatures will very likely result in reduced mental alertness, reduction in rational decision making, or loss of consciousness with the threat of fatal consequences. If the work day temperatures are below 35°F, a warmed break area (65° F or above) must be provided.

All project activities shall be inspected daily by the SHSO and findings documented on a Safety Inspection Report and forwarded to the project manager.

9.0 Employee Training

9.1 Tailgate Safety Meetings

Prior to the start of the project, all personnel will participate in an initial tailgate safety meeting. During the initial tailgate safety meeting, this SHSP will be discussed. The PS will ensure that the anticipated site hazards are summarized and explained to all personnel, and that those personnel are aware of the precautions they must take to minimize their exposure to those hazards. Tailgate safety meetings will be held at the start of each work shift. All new employees must attend the meeting and be familiar with this SHSP. Attendance records and meeting notes shall be maintained with the project file.

9.2 Hazardous Waste Training

All personnel entering the EZ or CRZ shall have completed at least 40 hours of hazardous waste operations-related training as required by 29 CFR 1910.120, or in California T8CCR-5192.

40 Hour Training for all personnel
3 days field experience
Current 8 Hour refresher (within the last 12 months)
8 Hour Supervisory training for supervisors
Trenching/Excavation competent person training
Entry Supervisor training for confined spaces
Confined Space entry training for workers

9.3 Hazard Communication

All personnel performing field activities will receive basic hazard communication training which involves a review of the IT written hazard communication program (IT Health and Safety Procedure HS060), MSDSs, container labeling, and chemical health hazards. Personnel will be trained on the hazards of chemicals handled or used on site by reviewing the MSDSs for that chemical. MSDSs will be obtained for all materials purchased or brought on site which require an MSDS and the MSDS will be kept on site with this SHSP.

9.4 Site Specific Training

Site-specific training will be accomplished through an initial review of this SHSP by the SHSO and through the daily tailgate safety meetings. All such training shall include signatures of all attendees and shall be documented in the project files

9.5 First Aid and Cardiopulmonary Resuscitation (CPR)

At least tow employees current in first aid/CPR will be assigned to the project and at least one of these will be on the site whenever operations are ongoing. First aid trained personnel shall also be trained in Blood borne pathogens hazards. Refresher training in first aid and CPR is required to maintain a current certificate. The SHSO shall be current in first aid/CPR training.

10.0 Medical Surveillance Program

IT Utilizes the services of Environmental Medicine Resources (EMR) for medical surveillance requirements for all projects. All personnel on site working within the CRZ or EZ, will have completed an occupational medical monitoring physical within the last 12 months and have in

their record written clearance to work on hazardous waste sites and to wear a respirator if required by the job.

11.0 Emergency Response Plan and Contingency Procedures

Site personnel must be prepared to respond and act quickly in the event of an emergency. Emergency preparedness and response procedures will aid in protecting site workers and the surrounding environment. Preplanning measures will include employee training, fire and explosion prevention and protection, chemical spill and discharge prevention and protection, and safe work practices to avoid personal injury or exposure.

11.1 Project Superintendent

At all times during scheduled work activities, a designated PS will be present on the site. This individual is responsible for implementing any emergency response or contingency procedures. Depending upon the circumstances and time permitting, the PS will review proposed response actions with the SHSO.

11.2 Site Health and Safety Officer

The SHSO is responsible for implementing, communicating, and enforcing health and safety policies and procedures during the course of the project. He will also assist in evaluation health and safety concerns with respect to environmental releases and emergency response actions. In the event of an injury, contact the Martinez Health and Safety Administrator at (925) 372-9100 for notification of the EMR medical incident reporting case manager. The SHSO is also responsible for accident investigation and reporting all accidents to IT and Navy personnel as required.

11.3 List of Emergency Contacts and Notification

The PS and SHSO will be notified immediately in the event of an emergency. The PS will immediately evaluate the incident and, if necessary, notify the Hunters Point Shipyard Fire Department. Telephone numbers for emergency contact personnel are listed in Table T-4. A hospital route map is located in Figure F-1.

11.4 Fire Control

In the event of a fire or explosion, or imminent danger of fire or explosion, all activities will halt and the Hunters Point Shipyard Fire Department will be notified immediately. If it is safe to do so, site personnel may use fire-fighting equipment available on site to remove and isolate flammable or other hazardous materials which may contribute to the fire.

The following measures will be implemented during site activities to minimize the risk of fire and/or explosion:

- Smoking is permitted on site only in a designated smoking areas.
- Good housekeeping procedures will be required on site.
- Material storage methods will be in accordance with manufacturers' recommendations.
- Flammable liquids will be stored in approved containers only.
- All storage, handling, or use of flammable and combustible materials will be conducted by trained personnel only.
- Entry and exit pathways will be kept clear of debris or obstacles.
- Work areas will be cleared of excess vegetation and obstructions.
- Hot Work watch and permits are required on site

11.5 Site Evacuation Procedures

The authority to order personnel to evacuate the area rests with the PS and the SHSO. In the event that site evacuation is required, a continuous , uninterrupted air horn will be sounded for approximately ten seconds. Personnel working on the site will immediately make their way to the muster point for a "head count".

11.6 Spill or Leaks

IT will maintain the following equipment and materials in the CRZ for use during spill response activities:

- Absorbent pads
- Granular absorbent material
- Polyethylene sheeting
- 55 Gallon drums
- Shovels and assorted hand tools

TABLES

TABLE T-1

FLYING INSECTS

Organism	Description	Habitat	Problem	Severity	Protection
Hornet	One inch long with some body hair. Abdomen is mostly black.	Round, paper-like nest hanging from trees, shrubs, or under eaves of buildings.	One nest may contain up to 100,000 hornets which will attack in force at the slightest provocation.	Severe pain, allergic reactions similar to bees.	Do not come near or disturb nest. If a hornet investigates you, do not move.
Mosquito	Small, dark, fragile body with transparent wings. From 1/8 to 1/4 inch long.	Where water is available for breeding.	Bites and sucks blood. Itching and swelling result.	Can transmit encephalitis and other diseases. Scratching causes secondary infections.	Use plenty of insect repellant and wear gloves.
Wasp	Very thin waist. Color can be black, yellow or orange with stripes.	Underground nest. Paper-like honeycomb nest in abandoned buildings hollow trees, etc.	Stings. Some species will attack if you get too close to the nest.	Severe pain, allergic reactions similar to bees. Can be fatal.	Avoid Nest. Do not swat at them.
Bee	Generally has yellow and black stripes and two pair of wings.	Hollow logs, underground nest, old buildings,	Stings when annoyed. Leaves venom sac in victim.	If person is allergic, nausea, shock, constriction of the airway can result. Death may result.	Be careful and watch where you walk. Cover exposed skin. Avoid areas where bees are swarming. Avoid wearing sweet fragrances and bright clothing. Move slowly or stand still when bees are swarming about you.

TABLE T-2

MINIMUM CLEARANCE FROM ENERGIZED OVERHEAD ELECTRIC LINES

Nominal System Voltage	Minimum Required Clearance
0 - 50 kV	10 feet
51 - 100 kV	12 feet
101 - 200 kV	15 feet
201 - 300 kV	20 feet
301 - 500 kV	25 feet
501 - 750 kV	35 feet
751 - 1000 kV	45 feet

NOTE: Whenever equipment operations must be performed closer than 20 feet from overhead power lines, the Program CIH must be notified. When clearance to proceed is received from the Program CIH, the electric utility company must be contacted to turn the power off or physically insulate (protect) the lines if the operation must be performed closer to the power line than is allowed in this table.

TABLE T-3

FIRE EXTINGUISHER REQUIREMENTS

Area	Rating	Location
Flammable liquids 5 gal or more used on worksite (not integral fuel tanks of motor vehicles.	10B	Within 50 feet.
Flammable or combustible liquids 60 gal or more. Stored inside a room, building or trailer.	20B	Outside of door of storage area and within 10 feet of the door.
Flammable liquids stored outside.	20-B	At least 25 feet but not more than 75 feet from storage area.
Tank trucks or vehicles used to transport or dispensing flammable or combustible liquids.	2A-20-BC	Mounted in or on vehicle.
Fueling area.	20-BC	Within 50 feet of service or fueling area.
Other storage areas.	2A-10-BC	Near exit no more than 75 feet unobstructed travel to extinguisher from anywhere in storage area.
Vehicle and heavy equipment.	1A-5-BC	Mounted in or on vehicle/ equipment.
Trailers/offices.	2A-10-BC	Mounted near exit not more than 75 unobstructed travel from anywhere in trailer/office.
Hot work activities	2A	Within 50 feet.

Note: These extinguisher ratings are the minimum acceptable for each listed application. Extinguishers with higher ratings may be substituted. For applications not listed, contact the Program CIH for guidance.

TABLE T-4

EMERGENCY PHONE NUMBERS

Hunters Point Shipyard Fire Department	
Emergency	911
Non-Emergency	(415) 330-0577
Confined Space Entry Notification	(415) 330-0577
Hunters Point Shipyard Fire Chief	(415) 330-0580
Hunters Point Shipyard Security Department	
Emergency	911
Non-Emergency	(415) 822-1653
HAZMAT Response (Fire Dept.)	
Emergency	911
Non-Emergency	(415) 330-0577
Medical Response	
Emergency	911
Non-Emergency (Fire Dept.)	(415) 330-0577
Poison Control Center (San Francisco)	(800) 523-2222
National Response Center	(800) 424-8802
Hot Works Permits (Fire Inspector)	(415) 330-0578

Key Project and IT Personnel

IT Program Manager:	Valerie Crooks	(925) 372-9100
Program CIH:	William Hetrick, CIH	(925) 372-9100 Pager: (925) 988-5979
Project Manager:	Dennis Julio, P.E.	(925) 372-5293 Pager: (925) 988-5045
Site Health & Safety Officer:	Jim Wright	(415) 822-2705 Pager: (888) 940-0561
Project Superintendent:	Kevin Stonestreet	(415) 822-2705 Pager: (925) 988-5341
Occupational Physician:	Elayne Theriault, M.D.	(800) 229-3674
Environmental Medicine Resources		(770) 455-0818

Medical Incident Reporting: Lea Bessey, R.N. Environmental Medicine Resources		(800) 229-3674
Navy Contact ROICC:	Andy Uehisa	(510) 749-5945
Navy Contact RPM:	Jil Finnegan	(650) 244-2554 Pager: (650) 615-3609
Hospital:		San Francisco General Hospital 22nd Street and Portrero Avenue San Francisco, CA (415) 206-8000

DIRECTIONS:

- Exit Hunters Point Annex on Evans Avenue
- Take a left on Army Street
- Proceed under freeway
- After freeway veer right onto Portrero Avenue
- Hospital will be four streets down on the right hand side (22nd Street)

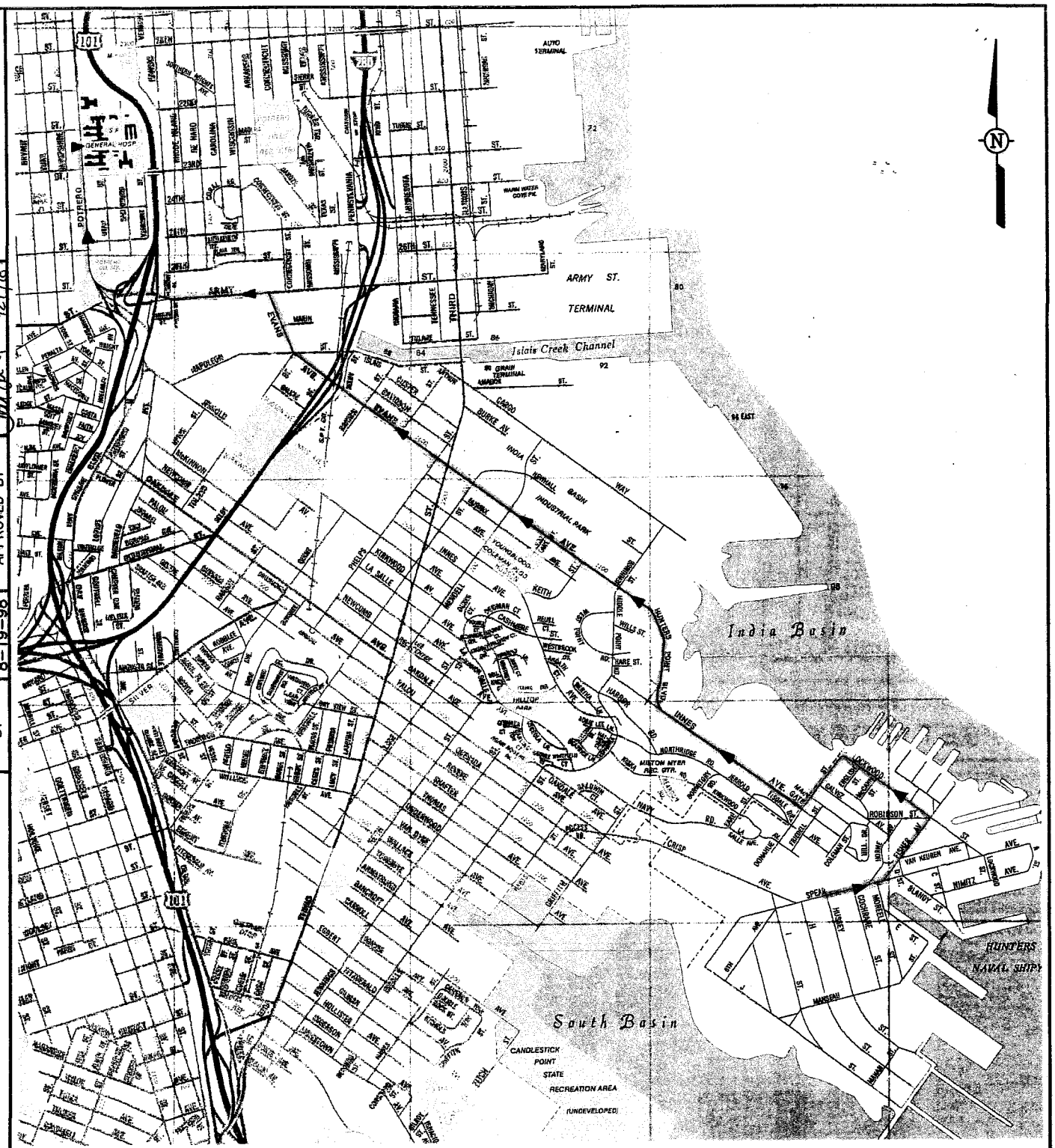
TABLE T-5

SAFETY AND EMERGENCY EQUIPMENT

- ☆ First Aid Kits
- ☆ Fire Extinguishers
- ☆ Eyewash
- ☆ Emergency Shower
- ☆ Thermometer
- ☆ Air Horn
- ☆ Traffic Control Signs
- ☆ Traffic Control Vests
- ☆ Traffic Cones
- ☆ Pulse Rate meter
- ☆ Safety Glasses/Goggles, ANSI Approved
- ☆ Hard Hats, ANSI Approved
- ☆ Ear Plugs, 25 dBA or Greater
- ☆ Work Gloves
- ☆ Steel Toed Work Boots, ANSI Approved
- ☆ Portable Toilet
- ☆ Drinking Water and Disposable Cups
- ☆ MSDS
- ☆ Completed H&S Plan
- ☆ Sun Block
- ☆ Shade

FIGURES

DRAWN BY	CHECKED BY	DRAWING NUMBER
	T.R.S.	775745-A2
	APPROVED BY	
	8-19-98	



NOT TO SCALE

FIGURE **F-1**

HOSPITAL ROUTE

SOIL REMOVAL FROM BUILDING 123
HUNTERS POINT SHIPYARD
DELIVERY ORDER #132
PREPARED FOR
DEPARTMENT OF THE NAVY
EFA WEST

INTERNATIONAL TECHNOLOGY CORPORATION

DIRECTIONS TO SAN FRANCISCO GENERAL HOSPITAL:

FROM THE SECURITY GATE AT DONAHUE ST. AND INNES AVE., TAKE INNES AVE, NORTH. TURN RIGHT ON HUNTERS POINT BLVD. WHICH EVENTUALLY BECOMES EVANS AVE. FOLLOW EVANS AVE. UNTIL ITS END AT ARMY ST. TURN LEFT ON ARMY ST. AND GO PAST HIGHWAY 101. JUST PAST HIGHWAY 101, TURN RIGHT ON POTRERO AVE. CONTINUE ON POTRERO AVE. TO THE HOSPITAL WHICH IS AT 22ND ST. AND POTRERO AVE.
TELEPHONE NUMBER (415) 206-8000

APPENDIX A

MATERIAL SAFETY DATA SHEETS

ENVIRONMENTAL RESOURCES ASSOCIATES -- AROCLOR 1242 PCB'S IN SOIL
MATERIAL SAFETY DATA SHEET
NSN: 684000D002614
Manufacturer's CAGE: 1R664
Part No. Indicator: A
Part Number/Trade Name: AROCLOR 1242 PCB'S IN SOIL

General Information

Company's Name: ENVIRONMENTAL RESOURCES ASSOCIATES
Company's Street: 5540 MARSHALL STREET
Company's City: ARVADA
Company's State: CO
Company's Country: US
Company's Zip Code: 80002
Company's Emerg Ph #: 303-431-8454
Company's Info Ph #: 303-431-8454
Record No. For Safety Entry: 001
Tot Safety Entries This Stk#: 001
Status: SE
Date MSDS Prepared: 15MAR88
Safety Data Review Date: 06SEP90
MSDS Preparer's Name: DANIEL A. GOLDSTEIN, M.D.
MSDS Serial Number: BHXRJ
Hazard Characteristic Code: T6
Unit Of Issue Container Qty: 50 GM
Type Of Container: BOTTLE, GLASS
Net Unit Weight: 50 GM

Ingredients/Identity Information

Proprietary: NO
Ingredient: CHLORODIPHENYL:42% CHLORINE (AROCHLOR 1242) (SARA III)
Ingredient Sequence Number: 01
Percent: <0.01
NIOSH (RTECS) Number: TQ1356000
CAS Number: 53469-21-9
OSHA PEL: S, 1 MG/M3
ACGIH TLV: S, 1MG/M3; 9192
Other Recommended Limit: NOT ESTABLISHED

Physical/Chemical Characteristics

Appearance And Odor: FINE GRAY POWDER. ODORLESS.
Decomposition Temperature: UNKNOWN
Solubility In Water: INSOLUBLE
Corrosion Rate (IPY): UNKNOWN

Fire and Explosion Hazard Data

Flash Point: NONE
Extinguishing Media: AS APPROPIATE FOR SURROUNDING FIRE.
Special Fire Fighting Proc: FIRE FIGHTERS SHOULD USE NIOSH APPROVED SCBA & FULL PROTECTIVE EQUIPMENT WHEN FIGHTING CHEMICAL FIRE. USE WATER SPRAY TO COOL NEARBY CONTAINERS EXPOSED TO FIRE.
Unusual Fire And Expl Hazrds: FIRE OR EXCESSIVE HEAT MAY CAUSE PRODUCTION OF HAZARDOUS DECOMPOSITION PRODUCTS.

Reactivity Data

Stability: YES
Cond To Avoid (Stability): NONE.
Materials To Avoid: NONE.
Hazardous Decomp Products: NONE NOTED.
Hazardous Poly Occur: NO

Health Hazard Data

LD50-LC50 Mixture: UNKNOWN
Route Of Entry - Inhalation: YES
Route Of Entry - Skin: YES
Route Of Entry - Ingestion: YES
Health Haz Acute And Chronic: PRIMARY IRRITANT. IRRITATES AND DAMAGES ALL TISSUES. MAY CAUSE LIVER, KIDNEY AND LUNG DAMAGE. MAY CAUSE CARDIAC ARRYTHMIA, MAY SENSITIZE THE HEART TO EPINEPHRINE. MAY CAUSE ALLERGIC DERMATITIS OR CHLORACNE. MAY CAUSE CANCER OF LIVER, OR HEMATOPOETIC SYSTEM.
Carcinogenicity - NTP: YES
Carcinogenicity - IARC: YES
Carcinogenicity - OSHA: NO
Explanation Carcinogenicity: LISTED UNDER NTP AND IARC.
Signs/Symptoms Of Overexp: RED, DRY SCALY SKIN. CRACKING AND WEEPING SKIN. COUGH AND WHEEZING. JAUNDICE, NAUSEA AND VOMITING. UREMIA. MAY CAUSE CHLORACNE.
Med Cond Aggravated By Exp: DERMATITIS, LIVER DISEASE, KIDNEY DISEASE, ANEMIAS AND LEUKOPENIAS.
Emergency/First Aid Proc: EYES:FLUSH WITH PLENTY OF WATER.IF IRRITATION PERSISTS,SEE DOCTOR. SKIN:REMOVE CONTAMINATED CLOTHING.WASH WITH SOAP AND WATER.IF IRRITATION PERSISTS SEE DOCTOR. INHALATION:REMOVE TO FRESH AIR.GIVE CPR/OXYGEN IF NEEDED. SEE DOCTOR. INGESTION:GIVE SYRUP OF IPECAC 30 CC AND 180 CC (6 OZ) OF WATER.SEE DOCTOR.

Precautions for Safe Handling and Use

Steps If Matl Released/Spill: VENTILATE AREA. DAMPEN WITH WATER SPRAY TO PREVENT DUST DISPERSION. CALL CLEANUP TEAM. DO NOT FLUSH TO DRAIN OR OPEN WATER.
Waste Disposal Method: INCINERATE OR DISPOSE AS HAZARDOUS WASTE. DISPOSE OF IN ACCORDANCE WITH FEDERAL.STATE AND LOCAL REGULATIONS.
Precautions-Handling/Storing: AVOID BREAKAGE. USE IN AREA WHERE SPILLS CAN BE CONTAINED.
Other Precautions: HANDLE WITH CARE! MATERIAL CONTAINS CARCINOGENS.

Control Measures

Respiratory Protection: PARTICULATE OR COMBINED VAPOR/PARTICULATE FULL FACE RESPIRATOR OR SELF CONTAINED POSITIVE PRESSURE FULL FACE UNIT.
Ventilation: LOCAL EXHAUST: USE IN HOOD.
Protective Gloves: VITON OR NEOPRENE.
Eye Protection: SPLASH GOGGLES.
Other Protective Equipment: CHEMICALLY IMPERVIOUS CLOTHING IF LARGE AMOUNTS IN USE. LABORATORY COAT, IMPERVIOUS APRON WITH SLEEVE AND CLOSED SHOES.
Work Hygienic Practices: USE CAREFUL LABORATORY TECHNIQUE. AVOID CONTACT.
Suppl. Safety & Health Data: NONE.

Transportation Data

Trans Data Review Date: 90249
DOT PSN Code: ZZZ
DOT Proper Shipping Name: NOT REGULATED BY THIS MODE OF TRANSPORTATION
IMO PSN Code: ZZZ
IMO Proper Shipping Name: NOT REGULATED FOR THIS MODE OF TRANSPORTATION
IATA PSN Code: ZZZ
IATA Proper Shipping Name: NOT REGULATED BY THIS MODE OF TRANSPORTATION
AFI PSN Code: ZZZ
AFI Prop. Shipping Name: NOT REGULATED BY THIS MODE OF TRANSPORTATION

Disposal Data

Label Data

Label Required: NO
Label Status: X
Common Name: LABEL COVERED UNDER EPA REGS - HAZCOM LABEL NOT AUTHORIZED

International Chemical Safety Cards

ARSENIC

ICSC: 0013

ARSENIC
Grey arsenic
Metallic arsenic
As
Atomic mass: 74.9

CAS # 7440-38-2
RTECS # CG0525000
ICSC # 0013
UN # 1558
EC # 033-001-00-X

TYPES OF HAZARD/ EXPOSURE	ACUTE HAZARDS/ SYMPTOMS	PREVENTION	FIRST AID/ FIRE FIGHTING
FIRE	Combustible. Gives off irritating or toxic fumes (or gases) in a fire.	NO open flames. NO contact with strong oxidizers. NO contact with hot surfaces.	Powder, water spray, foam, carbon dioxide.
EXPLOSION	Risk of fire and explosion is slight if in the form of fine powder or dust when exposed to hot surfaces or flames.	Prevent deposition of dust; closed system, dust explosion-proof electrical equipment and lighting.	
EXPOSURE		AVOID ALL CONTACT!	IN ALL CASES CONSULT A DOCTOR!
INHALATION	Cough. Diarrhoea. Shortness of breath. Sore throat. Vomiting. Weakness. Grey skin.	Closed system and ventilation.	Fresh air, rest. Artificial respiration if indicated. Refer for medical attention.
SKIN	Redness.	Protective gloves. Protective clothing.	Remove contaminated clothes. Rinse skin with plenty of water or shower.
EYES	Redness.	or eye protection in combination with breathing protection if powder.	First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then take to a doctor.
INGESTION	Diarrhoea. Nausea. Sore throat. Unconsciousness. Vomiting (further see Inhalation).	Do not eat, drink, or smoke during work. Wash hands before eating.	Rinse mouth. Induce vomiting (ONLY IN CONSCIOUS PERSONS!). Refer for medical attention.

SPILLAGE DISPOSAL	STORAGE	PACKAGING & LABELLING
Evacuate danger area! Sweep spilled substance into sealable containers. Carefully collect remainder, then remove to safe place. Do NOT let this chemical enter the environment (extra personal protection: complete protective clothing including self-contained breathing apparatus).	Provision to contain effluent from fire extinguishing. Separated from strong oxidants, acids, halogens, food and feedstuffs. Well closed. Keep in a well-ventilated room.	Do not transport with food and feedstuffs. T symbol R: 23/25 S: (1/2-)20/21-28-45 UN Hazard Class: 6.1 UN Packing Group: II Marine pollutant.

SEE IMPORTANT INFORMATION ON BACK

ICSC: 0013 Prepared in the context of cooperation between the International Programme on Chemical Safety & the Commission of the European Communities © IPCS CEC 1993

International Chemical Safety Cards

ARSENIC

ICSC: 0013

IMPORTANT DATA	**PHYSICAL STATE; APPEARANCE:** ODOURLESS, BRITTLE, GREY, METALLIC-LOOKING CRYSTALS. **PHYSICAL DANGERS:** **CHEMICAL DANGERS:** Upon heating, toxic fumes are formed. Reacts violently with strong oxidants and halogens causing fire and explosion hazard. Reacts with nitric acid, hot sulfuric acid. Toxic arsine gas may be formed in contact with acid or acidic substances and certain metals, such as galvanized or light metals. **OCCUPATIONAL EXPOSURE LIMITS (OELs):** TLV: ppm; 0.01 mg/m^3 (as TWA) A1 (ACGIH 1994-1995). **ROUTES OF EXPOSURE:** The substance can be absorbed into the body by inhalation of its aerosol, through the skin and by ingestion. **INHALATION RISK:** Evaporation at 20°C is negligible; a harmful concentration of airborne particles can, however, be reached quickly. **EFFECTS OF SHORT-TERM EXPOSURE:** The substance irritates the eyes, the skin and the respiratory tract. The substance may cause effects on the circulatory system, nervous system, kidneys and gastrointestinal tract , resulting in convulsions, kidney impairment, severe hemorrhage, losses of fluids, and electrolytes, shock and death. Exposure may result in death. The effects may be delayed. Medical observation is indicated. **EFFECTS OF LONG-TERM OR REPEATED EXPOSURE:** Repeated or prolonged contact with skin may cause dermatitis. Repeated or prolonged contact may cause skin sensitization. The substance may have effects on the mucous membranes, skin, kidneys, liver , resulting in neuropathy, pigmentation disorders, perforation of nasal septum and tissue lesions. This substance is carcinogenic to humans.
PHYSICAL PROPERTIES	Sublimation point: 613°C Relative density (water = 1): 5.7 Solubility in water: none
ENVIRONMENTAL DATA	The substance is toxic to aquatic organisms. It is strongly advised not to let the chemical enter into the environment because it persists in the environment.

NOTES

The substance is combustible but no flash point is available in literature. Depending on the degree of exposure, periodic medical examination is indicated. Do NOT take working clothes home. Refer also to cards for specific arsenic compounds, e.g., Arsenic pentoxide (ICSC # 0377), Arsenic trichloride (ICSC # 0221), Arsenic trioxide (ICSC # 0378), Arsine (ICSC # 0222).

ADDITIONAL INFORMATION

ICSC: 0013 **ARSENIC**

International Chemical Safety Cards

BERYLLIUM

ICSC: 0226

BERYLLIUM
Glucinium
(powder)
Be
Atomic mass: 9.0

CAS # 7440-41-7
RTECS # DS1750000
ICSC # 0226
UN # 1567
EC # 004-001-00-7

TYPES OF HAZARD/ EXPOSURE	ACUTE HAZARDS/ SYMPTOMS	PREVENTION	FIRST AID/ FIRE FIGHTING
FIRE	Combustible.	NO open flames.	Special powder, dry sand, NO other agents.
EXPLOSION	Finely dispersed particles form explosive mixtures in air.	Prevent deposition of dust; closed system, dust explosion-proof electrical equipment and lighting.	
EXPOSURE		PREVENT DISPERSION OF DUST! AVOID ALL CONTACT!	IN ALL CASES CONSULT A DOCTOR!
INHALATION	Cough. Shortness of breath. Sore throat. Weakness. Symptoms may be delayed (see Notes).	Local exhaust. Breathing protection.	Fresh air, rest. Refer for medical attention.
SKIN	Redness.	Protective gloves. Protective clothing.	Remove contaminated clothes. Rinse skin with plenty of water or shower.
EYES	Redness. Pain.	Face shield or eye protection in combination with breathing protection if powder.	First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then take to a doctor.
INGESTION		Do not eat, drink, or smoke during work. Wash hands before eating.	Rinse mouth. Do NOT induce vomiting. Refer for medical attention.

SPILLAGE DISPOSAL	STORAGE	PACKAGING & LABELLING
Evacuate danger area! Consult an expert! Carefully collect the spilled substance into containers; if appropriate moisten first, then remove to safe place. Do NOT let this chemical enter the environment (extra personal protection: complete protective clothing including self-contained breathing apparatus).	Separated from strong acids, bases, chlorinated solvents, food and feedstuffs.	Unbreakable packaging; put breakable packaging into closed unbreakable container. Do not transport with food and feedstuffs. T+ symbol R: 49-25-26-36/37/38-43-48/23 S: 53-45 Note: E UN Hazard Class: 6.1 UN Subsidiary Risks: 4.1 UN Packing Group: II

SEE IMPORTANT INFORMATION ON BACK

ICSC: 0226

International Chemical Safety Cards

BERYLLIUM

ICSC: 0226

PHYSICAL STATE; APPEARANCE:
GREY TO WHITE METAL OR POWDER.

PHYSICAL DANGERS:
Dust explosion possible if in powder or granular form, mixed with air.

CHEMICAL DANGERS:
Reacts with strong acids and strong bases forming combustible gas (HYDROGEN - see ICSC # 0001). Forms shock sensitive mixtures with some chlorinated solvents, such as carbon tetrachloride and trichloroethylene.

OCCUPATIONAL EXPOSURE LIMITS (OELs):
TLV (as TWA): ppm; 0.002 mg/m^3 A2 (Suspected Human Carcinogen) (ACGIH 1994-1995).

ROUTES OF EXPOSURE:
The substance can be absorbed into the body by inhalation of its aerosol and by ingestion.

INHALATION RISK:
Evaporation at 20°C is negligible; a harmful concentration of airborne particles can, however, be reached quickly when dispersed.

EFFECTS OF SHORT-TERM EXPOSURE:
The aerosol of this substance irritates the respiratory tract. Inhalation of dust or fumes may cause chemical pneumonitis. Exposure may result in death. The effects may be delayed. Medical observation is indicated.

EFFECTS OF LONG-TERM OR REPEATED EXPOSURE:
Repeated or prolonged contact may cause skin sensitization. Lungs may be affected by repeated or prolonged exposure to dust particles, resulting in chronic beryllium disease (cough, weight loss, weakness). This substance is carcinogenic to humans.

PHYSICAL PROPERTIES

Boiling point: above 2500°C
Melting point: 1287°C
Relative density (water = 1): 1.9
Solubility in water: none

ENVIRONMENTAL DATA

The substance is very toxic to aquatic organisms.

NOTES

Depending on the degree of exposure, periodic medical examination is indicated.

Transport Emergency Card: TEC (R)-61G10
NFPA Code: H3; F1; R0

ADDITIONAL INFORMATION

ICSC: 0226	BERYLLIUM

IMPORTANT LEGAL NOTICE:	Neither the CEC or the IPCS nor any person acting on behalf of the CEC or the IPCS is responsible for the use which might be made of this information. This card contains the collective views of the IPCS Peer Review Committee and may not reflect in all cases all the detailed requirements included in national legislation on the subject. The user should verify compliance of the cards with the relevant legislation in the country of use.

SHELL OIL -- SHELL LOW-SULFUR DEISELINE(R) - DIESEL FUEL
MATERIAL SAFETY DATA SHEET
NSN: 9140000000184
Manufacturer's CAGE: 54527
Part No. Indicator: A
Part Number/Trade Name: SHELL LOW-SULFUR DEISELINE(R)

General Information

Item Name: DIESEL FUEL
Company's Name: SHELL OIL COMPANY
Company's Street: HEALTH, SAFETY AND ENVIRONMENT
Company's P. O. Box: 4320
Company's City: HOUSTON
Company's State: TX
Company's Country: US
Company's Zip Code: 77210
Company's Emerg Ph #: 713-473-9461/800-424-9300(CHEMTREC)
Company's Info Ph #: 713-241-4819/4141/2252 FAX -6511
Distributor/Vendor # 1: GULER OIL INC (509-493-1611)
Distributor/Vendor # 1 Cage: 6Y706
Record No. For Safety Entry: 023
Tot Safety Entries This Stk#: 032
Status: SE
Date MSDS Prepared: 12FEB93
Safety Data Review Date: 19OCT94
Supply Item Manager: KY
MSDS Preparer's Name: J.C. WILLETT
MSDS Serial Number: BVGFQ
Hazard Characteristic Code: F4
Unit Of Issue: GL
Unit Of Issue Container Qty: UNKNOWN

Ingredients/Identity Information

Proprietary: NO
Ingredient: DISTILLATES,STREIGHT RUN MIDDLE
Ingredient Sequence Number: 01
Percent: 100%
NIOSH (RTECS) Number: LX3296000
CAS Number: 64741-44-2
OSHA PEL: NOT ESTABLISHED
ACGIH TLV: NOT ESTABLISHED
Other Recommended Limit: NONE RECOMMENDED

Physical/Chemical Characteristics

Appearance And Odor: YELLOW LIQUID, STRONG HYDROCARBON ODOR
Boiling Point: 325F,163C
Melting Point: N/A
Vapor Density (Air=1): >1
Specific Gravity: 0.8762
Decomposition Temperature: UNKNOWN
Solubility In Water: NEGLIGIBLE
pH: N/A
Corrosion Rate (IPY): UNKNOWN

Fire and Explosion Hazard Data

Flash Point: 125F,52C
Flash Point Method: PMCC
Extinguishing Media: USE WATER FOG, CARBON DIOXIDE, FOAM, OR DRY CHEMICAL.
Special Fire Fighting Proc: WEAR FIRE FIGHTING PROTECTIVE EQUIPMENT AND A FULL FACED SELF CONTAINED BREATHING APPARATUS. EVACUATE AREA. COOL FIRE EXPOSED CONTAINERS WITH WATER SPRAY.

Unusual Fire And Expl Hazrds: COMBUSTION OR HEAT OF FIRE MAY PRODUCE HAZARDOUS DECOMPOSITION PRODUCTS AND VAPORS. KEEP CONTAINERS COOL WITH WATER.

Reactivity Data

Stability: YES
Cond To Avoid (Stability): HIGH HEAT, OPEN FLAMES AND OTHER SOURCES OF IGNITION
Materials To Avoid: STRONG OXIDIZING AGENTS
Hazardous Decomp Products: TOXIC CARBON MONOXIDE AND CARBON DIOXIDE, ALDEHYDES, AROMATIC HYDROCARBONS, PARTICULATES & OTHER UNIDENTIFIED ORGANICS.
Hazardous Poly Occur: NO
Conditions To Avoid (Poly): NOT APPLICABLE

Health Hazard Data

LD50-LC50 Mixture: ORAL LD50 (RAT) IS UNKNOWN
Route Of Entry - Inhalation: YES
Route Of Entry - Skin: YES
Route Of Entry - Ingestion: YES
Health Haz Acute And Chronic: ACUTE-EYES/SKIN:MILD IRRITATION. INHALATION OF VAPORS OR MIST:IRRITATION TO RESPIRATORY TRACT, CNS DEPRESSION. INGESTION:PRACTICALLY NON-TOXIC; HOWEVER, IF ASPIRATED INTO LUNGS IT MAY CAUSE CHEMICAL PNEUMONITIS WHICH CAN BE FATAL. CHRONIC:DERMATITIS. MID DISTILLATE HAS CAUSED CHROMSOMAL/MUTAGENIC CHANGES IN ANIMALS.
Carcinogenicity - NTP: NO
Carcinogenicity - IARC: NO
Carcinogenicity - OSHA: NO
Explanation Carcinogenicity: WHOLE DIESEL ENGINE EXHAUST IS LISTED AS A PROBABLE CARCINOGEN BY IARC AND NIOSH.
HEADACHE, DIZZINESS, VERTIGO, WEAKNESS AND LOSS OF COORDINATION. ASPIRATION INTO LUNGS:COUGHING, LABORED BREATHING, CYANOSIS, KIDNEY AND LIVER DAMAGE.
Med Cond Aggravated By Exp: SKIN AND RESPIRATORY DISORDERS INCLUDING ALLERGIES.
Emergency/First Aid Proc: EYES:FLUSH WITH FRESH WATER FOR 15 MINUTES. SKIN: REMOVE CONTAMINATED CLOTHING. WASH SKIN THOROUGHLY WITH SOAP AND WATER. SEE A DOCTOR IF SYMPTOMS DEVELOP. INHALATION: REMOVE TO FRESH AIR. INGESTION: DO NOT INDUCE VOMINTING. IF VOMITING OCCURS, KEEP HEAD BELOW HIPS. CALL PHYSICIAN IMMEDIATELY.

Precautions for Safe Handling and Use

Steps If Matl Released/Spill: WEAR PROTECTIVE GEARS. ELIMINATE ALL OPEN FLAMES. STOP SOURCE OF THE LEAK. DIKE TO CONTAIN LIQUID. RECOVER BY PUMPING OR ABSORB WITH INERT ABSORBENT MATERIALS AND SAVE IN COVERED DRUM FOR DISPOSAL. DO NOT POLLUTE WATERWAYS.
Neutralizing Agent: NONE
Waste Disposal Method: SEND FOR RECYCLING OR DISPOSE OF IN ACCORDANCE WITH LOCAL, STATE AND FEDERAL REGULATIONS.
Precautions-Handling/Storing: STORE IN A COOL AREA. KEEP CONTAINERS TIGHTLY CLOSED.
Other Precautions: EMPTY CONTAINERS RETAIN RESIDUE. DO NOT PRESSURIZE, CUT, WELD OR EXPOSE TO HEAT, FLAME, STATIC ELECTRICITY, OR OTHER SOURCES OF IGNITION; THEY MAY EXPLODE AND CAUSE INJURY.

Control Measures

Respiratory Protection: NONE NORMALLY REQUIRED. USE NIOSH APPROVED SELF-CONTAINED BREATHING APPARATUS IF TLV IS EXCEEDED OR WHEN SPRAYING OR USING IN CONFINED SPACES.
Ventilation: GENERAL OR LOCAL TO KEEP BELOW TLV.
Protective Gloves: PVC
Eye Protection: GOGGLES

Other Protective Equipment: WEAR PROTECTIVE CLOTHINGS.
Work Hygienic Practices: WASH HANDS THOROUGHLY AFTER HANDLING THIS PRODUCT.
Suppl. Safety & Health Data: NONE

Transportation Data

Trans Data Review Date: 94292
DOT PSN Code: GTF
DOT Proper Shipping Name: GAS OIL OR DIESEL FUEL OR HEATING OIL, LIGHT
DOT Class: 3
DOT ID Number: UN1202
DOT Pack Group: III
DOT Label: FLAMMABLE LIQUID
IMO PSN Code: HRR
IMO Proper Shipping Name: GAS OIL
IMO Regulations Page Number: 3375
IMO UN Number: 1202
IMO UN Class: 3.3
IMO Subsidiary Risk Label: -
IATA PSN Code: MTX
IATA UN ID Number: 1202
IATA Proper Shipping Name: GAS OIL
IATA UN Class: 3
IATA Label: FLAMMABLE LIQUID
AFI PSN Code: MTX
AFI Prop. Shipping Name: GAS OIL OR DIESEL FUEL OR HEATING OIL, LIGHT
AFI Class: 3
AFI ID Number: UN1202
AFI Pack Group: III
AFI Basic Pac Ref: 7-7
Additional Trans Data: CONTAINS STRIGHT-RUN MID DISTILLATES(PETROLEUM) CAS #64741-44-2.

Disposal Data

Label Data

Label Required: YES
Technical Review Date: 19OCT94
Label Status: F
Common Name: SHELL LOW-SULFUR DEISELINE(R)
Signal Word: WARNING!
Acute Health Hazard-Slight: X
Contact Hazard-Slight: X
Fire Hazard-Moderate: X
Reactivity Hazard-None: X
Special Hazard Precautions: FLAMMABLE LIQUID! DIESEL FUEL(PETROLEUM IRRITATION, CNS DEPRESSIONS. INGESTION:PRACTICALLY NON-TOXIC; HOWEVER, IF ASPIRATED INTO LUNGS IT MAY CAUSE CHEMICAL PNEUMONITIS WHICH CAN BE FATAL. CHRONIC:DERMATITIS. STORE IN A COOL AREA. KEEP CONTAINERS TIGHTLY CLOSED. FIRST AID: EYES:FLUSH WITH FRESH WATER FOR 15 MINUTES. SKIN: REMOVE CONTAMINATED CLOTHING. WASH SKIN THOROUGHLY WITH SOAP AND WATER. SEE A DOCTOR IF SYMPTOMS DEVELOP. INHALATION: REMOVE TO FRESH AIR. INGESTION:GET IMMEDIATE MEDICAL HELP. DO NOT INDUCE VOMINTING. IF VOMITING OCCURS, KEEP HEAD BELOW HIP.
Protect Skin: Y
Protect Respiratory: Y
Label Name: SHELL OIL COMPANY
Label Street: HEALTH, SAFETY AND ENVIRONMENT
Label P.O. Box: 4320
Label City: HOUSTON
Label State: TX
Label Zip Code: 77210

Label Country: US
Label Emergency Number: 713-473-9461/800-424-9300(CHEMTREC)
Year Procured: 1994

Please reduce your browser font size for better viewing and printing.

MSDS Material Safety Data Sheet

From: Mallinckrodt Baker, Inc.
222 Red School Lane
Phillipsburg, NJ 08865

MALLINCKRODT J.T.Baker

24 Hour Emergency Telephone: 908-859-2151
CHEMTREC: 1-800-424-9300

National Response in Canada
CANUTEC: 613-996-6666

Outside U.S. and Canada
Chemtrec: 202-483-7616

NOTE: CHEMTREC, CANUTEC and National Response Center emergency numbers to be used only in the event of chemical emergencies involving a spill, leak, fire, exposure or accident involving chemicals.

All non-emergency questions should be directed to Customer Service (1-800-582-2537) for assistance.

LEAD METAL

MSDS Number: L2347 --- *Effective Date: 12/08/96*

1. Product Identification

Synonyms: Granular lead, pigment metal; C.I. 77575
CAS No.: 7439-92-1
Molecular Weight: 207.19
Chemical Formula: Pb
Product Codes: J.T. Baker: 2256, 2266 Mallinckrodt: 5668

2. Composition/Information on Ingredients

Ingredient	CAS No	Percent	Hazardous
Lead	7439-92-1	95 - 100%	Yes

3. Hazards Identification

Emergency Overview

POISON! DANGER! MAY BE FATAL IF SWALLOWED OR INHALED. CAUSES IRRITATION TO SKIN, EYES AND RESPIRATORY TRACT. NEUROTOXIN. AFFECTS THE GUM TISSUE, CENTRAL NERVOUS SYSTEM, KIDNEYS, BLOOD AND REPRODUCTIVE SYSTEM. POSSIBLE CANCER HAZARD. MAY CAUSE CANCER BASED ON ANIMAL DATA. Risk of cancer depends on duration and level of exposure.

J.T. Baker SAF-T-DATA(tm) Ratings (Provided here for your convenience)

Health Rating: 3 - Severe (Life)
Flammability Rating: 0 - None
Reactivity Rating: 0 - None
Contact Rating: 1 - Slight
Lab Protective Equip: GOGGLES; LAB COAT; VENT HOOD; PROPER GLOVES
Storage Color Code: Blue (Health)

Potential Health Effects

Inhalation:
Lead can be absorbed through the respiratory system. Local irritation of bronchia and lungs can occur and, in cases of acute exposure, symptoms such as metallic taste, chest and abdominal pain, and increased lead blood levels may follow. See also Ingestion.

Ingestion:
POISON! The symptoms of lead poisoning include abdominal pain and spasms, nausea, vomiting, headache. Acute poisoning can lead to muscle weakness, "lead line" on the gums, metallic taste, definite loss of appetite, insomnia, dizziness, high lead levels in blood and urine with shock, coma and death in extreme cases.

Skin Contact:
Lead and lead compounds may be absorbed through the skin on prolonged exposure; the symptoms of lead poisoning described for ingestion exposure may occur. Contact over short periods may cause local irritation, redness and pain.

Eye Contact:
Absorption can occur through eye tissues but the more common hazards are local irritation or abrasion.

Chronic Exposure:
Lead is a cumulative poison and exposure even to small amounts can raise the body's content to toxic levels. The symptoms of chronic exposure are like those of ingestion poisoning; restlessness, irritability, visual disturbances, hypertension and gray facial color may also be noted.

Aggravation of Pre-existing Conditions:
Persons with pre-existing kidney, nerve or circulatory disorders or with skin or eye problems may be more susceptible to the effects of this substance.

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4. First Aid Measures

Inhalation:
Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

Ingestion:
Induce vomiting immediately as directed by medical personnel. Never give anything by mouth to an unconscious person. Get medical attention.

Skin Contact:
Immediately flush skin with plenty of soap and water for at least 15 minutes. Remove contaminated clothing and shoes. Get medical attention. Wash clothing before reuse.

Thoroughly clean shoes before reuse.

Eye Contact:
Immediately flush eyes with plenty of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Get medical attention immediately.

5. Fire Fighting Measures

Fire:
Not considered to be a fire hazard. Powder/dust is flammable when heated or exposed to flame.

Explosion:
Not considered to be an explosion hazard.

Fire Extinguishing Media:
Use any means suitable for extinguishing surrounding fire. Do not allow water runoff to enter sewers or waterways.

Special Information:
In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode. Can produce toxic lead fumes at elevated temperatures and also react with oxidizing materials.

6. Accidental Release Measures

Ventilate area of leak or spill. Wear appropriate personal protective equipment as specified in Section 8. Spills: Sweep up and containerize for reclamation or disposal. Vacuuming or wet sweeping may be used to avoid dust dispersal. US Regulations (CERCLA) require reporting spills and releases to soil, water and air in excess of reportable quantities. The toll free number for the US Coast Guard National Response Center is (800) 424-8802.

7. Handling and Storage

Keep in a tightly closed container, stored in a cool, dry, ventilated area. Protect against physical damage. Isolate from incompatible substances. Areas in which exposure to lead metal or lead compounds may occur should be identified by signs or appropriate means, and access to the area should be limited to authorized persons. Containers of this material may be hazardous when empty since they retain product residues (dust, solids); observe all warnings and precautions listed for the product.

8. Exposure Controls/Personal Protection

Airborne Exposure Limits:
For lead, metal and inorganic dusts and fumes, as Pb: -OSHA Permissible Exposure Limit (PEL): 0.05 mg/m3 (TWA) For lead, elemental and inorganic compounds, as Pb: -ACGIH

Threshold Limit Value (TLV): 0.05 mg/m3 (TWA), A3 animal carcinogen ACGIH Biological Exposure Indices (BEI): 30 ug/100ml, notation B (see actual Indices for more information). For lead, inorganic: -NIOSH Recommended Exposure Limit (REL): 0.1 mg/m3 (TWA)

Ventilation System:
A system of local and/or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, *Industrial Ventilation, A Manual of Recommended Practices*, most recent edition, for details.

Personal Respirators (NIOSH Approved):
If the exposure limit is exceeded, a half-face high efficiency dust/mist respirator may be worn for up to ten times the exposure limit or the maximum use concentration specified by the appropriate regulatory agency or respirator supplier, whichever is lowest. A full-face piece high efficiency dust/mist respirator may be worn up to 50 times the exposure limit, or the maximum use concentration specified by the appropriate regulatory agency or respirator supplier, whichever is lowest. For emergencies or instances where the exposure levels are not known, use a full-facepiece positive-pressure, air-supplied respirator. WARNING: Air-purifying respirators do not protect workers in oxygen-deficient atmospheres.

Skin Protection:
Wear impervious protective clothing, including boots, gloves, lab coat, apron or coveralls, as appropriate, to prevent skin contact.

Eye Protection:
Use chemical safety goggles and/or full face shield where dusting or splashing of solutions is possible. Maintain eye wash fountain and quick-drench facilities in work area.

Other Control Measures:
Eating, drinking, and smoking should not be permitted in areas where solids or liquids containing lead compounds are handled, processed, or stored. See OSHA substance-specific standard for more information on personal protective equipment, engineering and work practice controls, medical surveillance, record keeping, and reporting requirements. (29 CFR 1910.1025).

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9. Physical and Chemical Properties

Appearance:
Small, white to blue-gray metallic shot or granules.

Odor:
Odorless.

Solubility:
Insoluble in water.

Density:
11.34

pH:
No information found.

% Volatiles by volume @ 21C (70F):
0

Boiling Point:
1740C (3164F)

Melting Point:
327.5C (622F)

Vapor Density (Air=1):
No information found.

Vapor Pressure (mm Hg):
1.77 @ 1000C (1832F)

Evaporation Rate (BuAc=1):
No information found.

10. Stability and Reactivity

Stability:
Stable under ordinary conditions of use and storage.

Hazardous Decomposition Products:
Does not decompose but toxic lead or lead oxide fumes may form at elevated temperatures.

Hazardous Polymerization:
Will not occur.

Incompatibilities:
Ammonium nitrate, chlorine trifluoride, hydrogen peroxide, sodium azide, zirconium, disodium acetylide, sodium acetylide and oxidants.

Conditions to Avoid:
Heat, flames, ignition sources and incompatibles.

11. Toxicological Information

Toxicological Data:
Investigated as a tumorigen, mutagen, reproductive effector.

Reproductive Toxicity:
Lead and other smelter emissions are human reproductive hazards. (Chemical Council on Environmental Quality; Chemical Hazards to Human Reproduction, 1981).

Carcinogenicity:
EPA / IRIS classification: Group B2 - Probable human carcinogen, sufficient animal evidence.

--------\Cancer Lists\----------

Ingredient	---NTP Carcinogen--- Known	Anticipated	IARC Category

Lead (7439-92-1)	No	No	2B

12. Ecological Information

Environmental Fate:
When released into the soil, this material is not expected to leach into groundwater. This material may bioaccumulate to some extent.

Environmental Toxicity:
No information found.

13. Disposal Considerations

Whatever cannot be saved for recovery or recycling should be managed in an appropriate and approved waste facility. Although not a listed RCRA hazardous waste, this material may exhibit one or more characteristics of a hazardous waste and require appropriate analysis to determine specific disposal requirements. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

14. Transport Information

Not regulated.

15. Regulatory Information

--------\Chemical Inventory Status - Part 1\

Ingredient	TSCA	EC	Japan	Australia
Lead (7439-92-1)	Yes	Yes	Yes	Yes

--------\Chemical Inventory Status - Part 2\

Ingredient	Korea	--Canada-- DSL	NDSL	Phil.
Lead (7439-92-1)	Yes	Yes	No	Yes

--------\Federal, State & International Regulations - Part 1\

Ingredient	-SARA 302- RQ	TPQ	------SARA 313------ List	Chemical Catg.
Lead (7439-92-1)	No	No	Yes	No

--------\Federal, State & International Regulations - Part 2\

Ingredient	CERCLA	-RCRA- 261.33	-TSCA- 8(d)

Lead (7439-92-1)	10	No	No

Chemical Weapons Convention: No TSCA 12(b): No CDTA: No
SARA 311/312: Acute: Yes Chronic: Yes Fire: No Pressure: No
Reactivity: No (Pure / Solid)

Prop 65:
THIS PRODUCT CONTAINS CHEMICALS KNOWN TO THE STATE OF CALIFORNIA TO CAUSE CANCER AND BIRTH DEFECTS OR OTHER REPRODUCTIVE HARM.

Australian Hazchem Code: No information found.
Poison Schedule: S6

WHMIS:
This MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

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16. Other Information

NFPA Ratings: Health: 3 **Flammability:** 1 **Reactivity:** 0

Label Hazard Warning:
POISON! DANGER! MAY BE FATAL IF SWALLOWED OR INHALED. CAUSES IRRITATION TO SKIN, EYES AND RESPIRATORY TRACT. NEUROTOXIN. AFFECTS THE GUM TISSUE, CENTRAL NERVOUS SYSTEM, KIDNEYS, BLOOD AND REPRODUCTIVE SYSTEM. POSSIBLE CANCER HAZARD. MAY CAUSE CANCER BASED ON ANIMAL DATA. Risk of cancer depends on duration and level of exposure.

Label Precautions:
Do not get in eyes, on skin, or on clothing. Do not breathe dust. Keep container closed. Use only with adequate ventilation. Wash thoroughly after handling.

Label First Aid:
If swallowed, induce vomiting immediately as directed by medical personnel. Never give anything by mouth to an unconscious person. If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. In case of contact, immediately flush eyes or skin with plenty of water for at least 15 minutes. Remove contaminated clothing and shoes. Wash clothing before reuse. In all cases, get medical attention.

Product Use:
Laboratory Reagent.

Revision Information:
Pure. New 16 section MSDS format, all sections have been revised.

Disclaimer:
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Prepared by: Strategic Services Division
Phone Number: (314) 539-1600 (U.S.A.)

AEROSPACE LUBRICANTS -- TRIBOLUBE-L1 LUBRICATING OIL
MATERIAL SAFETY DATA SHEET
NSN: 915000N035776
Manufacturer's CAGE: 66164
Part No. Indicator: A
Part Number/Trade Name: TRIBOLUBE-L1 LUBRICATING OIL

General Information

Company's Name: AEROSPACE LUBRICANTS INC
Company's Street: 1505 DELASHMUT AVE
Company's City: COLUMBUS
Company's State: OH
Company's Country: US
Company's Zip Code: 43212
Company's Emerg Ph #: 614-291-3045
Company's Info Ph #: 614-291-3045
Record No. For Safety Entry: 001
Tot Safety Entries This Stk#: 001
Status: SMJ
Date MSDS Prepared: 04MAR89
Safety Data Review Date: 21OCT92
MSDS Serial Number: BQGLH
Hazard Characteristic Code: NK

Ingredients/Identity Information

Proprietary: NO
Ingredient: NONHAZARDOUS INGREDIENTS
Ingredient Sequence Number: 01
NIOSH (RTECS) Number: 1000314NH
OSHA PEL: NOT APPLICABLE
ACGIH TLV: NOT APPLICABLE

Physical/Chemical Characteristics

Appearance And Odor: RED-BROWN, ODORLESS.
Boiling Point: >400F,>204C
Melting Point: N/A
Vapor Pressure (MM Hg/70 F): 0.1
Vapor Density (Air=1): N/A
Specific Gravity: 0.8404(H*2O=1)
Solubility In Water: NEGLIGIBLE

Fire and Explosion Hazard Data

Flash Point: 460F,238C
Flash Point Method: COC
Lower Explosive Limit: N/A
Upper Explosive Limit: N/A
Extinguishing Media: CARBON DIOXIDE, DRY CHEMICAL, CHEMICAL FOAM, WATER FOG.
Special Fire Fighting Proc: WEAR NIOSH/MSHA APPRVD SCBA & FULL PROT EQUIP(FP N).
Unusual Fire And Expl Hazrds: DO NOT WELD, HEAT/DRILL CONTAINER. RESIDUE MAY IGNITE WITH EXPLOSIVE FORCE IF HEATED SUFFICIENTLY. DO NOT USE PRESSURE TO EMPTY DRUM/CAN/EXPLOSION MAY RESULT.

Reactivity Data

Stability: YES
Cond To Avoid (Stability): NONE SPECIFIED BY MANUFACTURER.
Materials To Avoid: MAY REACT WITH STRONG OXIDIZING MATERIALS.
Hazardous Decomp Products: NORMAL COMBUSTION CAUSES CARBON DIOXIDE AND WATER; INCOMPLETE COMBUSTION MAY CAUSE CARBON MONOXIDE.

Hazardous Poly Occur: NO
Conditions To Avoid (Poly): NOT RELEVANT

Health Hazard Data

LD50-LC50 Mixture: NONE SPECIFIED BY MANUFACTURER.
Route Of Entry - Inhalation: NO
Route Of Entry - Skin: NO
Route Of Entry - Ingestion: NO
Health Haz Acute And Chronic: ACUTE/CHRONIC: NONE.
Carcinogenicity - NTP: NO
Carcinogenicity - IARC: NO
Carcinogenicity - OSHA: NO
Explanation Carcinogenicity: NOT RELEVANT
Signs/Symptoms Of Overexp: PROLONGED AND REPEATED CONTACT W/SKIN MAY CAUSE IRRITATION.
Med Cond Aggravated By Exp: NONE KNOWN.
Emergency/First Aid Proc: INHAL: NO SPECIAL RESP PROT REQD. REMOVE TO FRESH AIR. SUPPORT BRTHG (GIVE O*2/ARTF RESP) (FP N). EYES: FLUSH WITH WATER FOR AT LEAST 15 MIN AND CONSULT PHYSICIAN. SKIN: WASH WITH SOAP AND WATER; IF IRRITATION OCCURS, CONSULT PHYSICIAN. INGEST: CONSULT PHYSICIAN.

Precautions for Safe Handling and Use

Steps If Matl Released/Spill: STOP SOURCE OF LEAK. CLEAN UP AS SOON AS POSSIBLE. CONTAIN LIQUID TO PREVENT FURTHER CONTAMINATION OF SOIL, SURFACE AND GROUND WATER.
Neutralizing Agent: NONE SPECIFIED BY MANUFACTURER.
Waste Disposal Method: DISPOSE OF IN ACCORDANCE WITH FEDERAL, STATE AND LOCAL REGULATIONS.
Precautions-Handling/Storing: DO NOT STORE ABOVE 250F OR NEAR FLAMMABLES.
Other Precautions: AVOID SPILLS.

Control Measures

Respiratory Protection: NOT REQUIRED. USE NIOSH/MSHA APPROVED RESPIRATOR APPROPRIATE FOR EXPOSURE OF CONCERN (FP N).
Ventilation: LOCAL EXHAUST/MECH(GEN).
Protective Gloves: PLASTIC DISPOSABLE.
Eye Protection: CHEMICAL WORKERS GOGGLES (FP N).
Other Protective Equipment: PLASTIC/FABRIC APRON OR LAB COAT AS NEEDED.
Work Hygienic Practices: DO NOT CONTAMINATE SMOKING MATERIALS.
Suppl. Safety & Health Data: NONE SPECIFIED BY MANUFACTURER.

Transportation Data

Trans Data Review Date: 93096
DOT PSN Code: ZZZ
DOT Proper Shipping Name: NOT REGULATED BY THIS MODE OF TRANSPORTATION
IMO PSN Code: ZZZ
IMO Proper Shipping Name: NOT REGULATED FOR THIS MODE OF TRANSPORTATION
IATA PSN Code: ZZZ
IATA Proper Shipping Name: NOT REGULATED BY THIS MODE OF TRANSPORTATION
AFI PSN Code: ZZZ
AFI Prop. Shipping Name: NOT REGULATED BY THIS MODE OF TRANSPORTATION
Additional Trans Data: NOT REGULATED FOR TRANSPORTATION

Disposal Data

Label Data

Label Required: YES
Technical Review Date: 20OCT92
Label Date: 20OCT92

Label Status: G
Common Name: TRIBOLUBE-L1 LUBRICATING OIL
Chronic Hazard: YES
Signal Word: CAUTION!
Acute Health Hazard-Slight: X
Contact Hazard-Slight: X
Fire Hazard-Slight: X
Reactivity Hazard-None: X
PROLONGED AND REPEATED SKIN CONTACT MAY CAUSE IRRITATION.
Protect Eye: Y
Protect Skin: Y
Protect Respiratory: Y
Label Name: AEROSPACE LUBRICANTS INC
Label Street: 1505 DELASHMUT AVE
Label City: COLUMBUS
Label State: OH
Label Zip Code: 43212
Label Country: US
Label Emergency Number: 614-291-3045

BUEHLER LTD -- MINERAL SPIRITS, 40-8140-032
MATERIAL SAFETY DATA SHEET
NSN: 801000N026907
Manufacturer's CAGE: 09410
Part No. Indicator: A
Part Number/Trade Name: MINERAL SPIRITS, 40-8140-032

General Information

Company's Name: BUEHLER LTD
Company's Street: 41 WAUKEGAN RD
Company's City: LAKE BLUFF
Company's State: IL
Company's Country: US
Company's Zip Code: 60044
Company's Emerg Ph #: 708-295-6500
Company's Info Ph #: 708-295-6500
Record No. For Safety Entry: 001
Tot Safety Entries This Stk#: 001
Status: SMJ
Date MSDS Prepared: 09MAR90
Safety Data Review Date: 10JUL95
Supply Item Manager: CX
MSDS Preparer's Name: TOM DERAM
Preparer's Company: SAME
MSDS Serial Number: BMDFV
Hazard Characteristic Code: F4

Ingredients/Identity Information

Proprietary: NO
Ingredient: PETROLEUM;(PETROLEUM DISTILLATES)
Ingredient Sequence Number: 01
Percent: 100
NIOSH (RTECS) Number: SE7449000
CAS Number: 8002-05-9
OSHA PEL: 400 PPM (MFR)
ACGIH TLV: NOT APPLICABLE

Physical/Chemical Characteristics

Appearance And Odor: CLEAR, WATER WHITE LIQUID, MILD CHARACTERISTIC ODOR.
Boiling Point: 328F,164C
Vapor Pressure (MM Hg/70 F): 0.4 @ 68F
Vapor Density (Air=1): HVR/AIR
Specific Gravity: 0.81
Evaporation Rate And Ref: SLOWER THAN ETHER
Solubility In Water: NEGLIGIBLE
Percent Volatiles By Volume: 100

Fire and Explosion Hazard Data

Flash Point: 110F,43C
Flash Point Method: TCC
Extinguishing Media: CO*2 FOAM, DRY CHEMICAL, WATER SPRAY. DO NOT USE DIRECT WATER STREAM.
Special Fire Fighting Proc: USE NIOSH/MSHA APPROVED SCBA AND FULL PROTECTIVE EQUIPMENT (FP N). COOL EXPOSED CONTAINERS WITH WATER.
Unusual Fire And Expl Hazrds: COMBUSTIBLE LIQUID - CLASS II. DO NOT STORE OR MIX WITH STRONG OXIDANTS.

Reactivity Data

Stability: YES
Cond To Avoid (Stability): HEAT, SPARKS AND OPEN FLAME.

Materials To Avoid: STRONG OXIDIZING AGENTS LIKE LIQUID CHLORINE OR CONCENTRATED OXYGEN.
Hazardous Decomp Products: THERMAL DECOMPOSITION MAY YIELD CO.
Hazardous Poly Occur: NO
Conditions To Avoid (Poly): HEAT, SPARKS AND OPEN FLAME.

Health Hazard Data

LD50-LC50 Mixture: NONE SPECIFIED BY MANUFACTURER.
Route Of Entry - Inhalation: YES
Route Of Entry - Skin: NO
Route Of Entry - Ingestion: YES
Health Haz Acute And Chronic: ACUTE/CHRONIC: NONE EXPECTED WHEN GOOD HYGENIC PRACTICES ARE EMPLOYED.
Carcinogenicity - NTP: NO
Carcinogenicity - IARC: NO
Carcinogenicity - OSHA: NO
Explanation Carcinogenicity: NOT RELEVANT
Signs/Symptoms Of Overexp: EFFECTS OF OVER EXPOSURE: BREATHING HIGH VAPOR CONCENTRATIONS MAY RESULT IN MILD DEPRESSION,DIZZINESS, HEADACHE, RESPIRATORY IRRITATION, CONVULSIONS OR LOSS OF CONSCIOUSNESS. CONTACT MAY IRRITATE EYES OR SKIN.
Med Cond Aggravated By Exp: NONE SPECIFIED BY MANUFACTURER.
Emergency/First Aid Proc: INHAL: IF OVERCOME, MOVE PATIENT TO FRESH AIR AND CALL MD. APPLY ARTF RESP IF NECESSARY. SKIN/EYE: FLUSH WITH COPIOUS AMOUNTS OF WATER FOR AT LEAST 15 MINUTES, GET MED ATTN. INGEST: DO NOT INDUCE VOMITING. CALL MD.

Precautions for Safe Handling and Use

Steps If Matl Released/Spill: REMOVE IGNITION SOURCES, AVOID BREATHING VAPORS OR CONTACT WITH LIQUID. USE ABSORBANT MATERIAL FOR SMALL SPILLS. KEEP SPILLED MATERIAL OUT OF SEWERS, DITCHES AND BODIES OF WATER.
Neutralizing Agent: NONE SPECIFIED BY MANUFACTURER.
Waste Disposal Method: INCINERATE UNDER SAFE CONDITIONS DISPOSE OF IN ACCORDANCE WITH LOCAL, STATE AND FEDERAL REGULATIONS.
Precautions-Handling/Storing: KEEP AWAY FROM HEAT, SPARKS AND OPEN FLAME. KEEP CONTAINERS CLOSED WHEN NOT IN USE.
Other Precautions: AVOID EYE CONTACT AND PROLONGED OR REPEATED CONTACT WITH SKIN.

Control Measures

Respiratory Protection: APPROPRIATE NIOSH/MSHA APPROVED VAPOR CANISTER, SCBA OR SUPPLIED AIR HOSE MASK IF NEEDED.
Ventilation: LOCAL EXHAUST: TO KEEP WORK ROOM CONCENTRATION BELOW SAFETY AND HEALTH REQUIREMENTS. USE EXPLOSION PROOF EQUIPMENT.
Protective Gloves: RUBBER OR NEOPRENE GLOVES.
Eye Protection: CHEMICAL WORKERS GOGGLES (FP N).
Other Protective Equipment: IMPERVIOUS CLOTHING OR BOOTS IF NEEDED.
Work Hygienic Practices: GOOD PERSONAL HYGIENE TO BE FOLLOWED AT ALL TIMES.
Suppl. Safety & Health Data: NONE SPECIFIED BY MANUFACTURER.

Transportation Data

Trans Data Review Date: 92080
DOT PSN Code: GJL
DOT Proper Shipping Name: FLAMMABLE LIQUIDS, N.O.S.
DOT Class: 3
DOT ID Number: UN1993
DOT Pack Group: III
DOT Label: FLAMMABLE LIQUID
IMO PSN Code: HIA
IMO Proper Shipping Name: FLAMMABLE LIQUID, N.O.S. o

IMO Regulations Page Number: 3345
IMO UN Number: 1993
IMO UN Class: 3.3
IMO Subsidiary Risk Label: -
IATA PSN Code: MCA
IATA UN ID Number: 1993
IATA Proper Shipping Name: FLAMMABLE LIQUID, N.O.S. *
IATA UN Class: 3
IATA Label: FLAMMABLE LIQUID
AFI PSN Code: MCA
AFI Prop. Shipping Name: FLAMMABLE LIQUIDS, N.O.S.
AFI Class: 3
AFI ID Number: UN1993
AFI Pack Group: III
AFI Basic Pac Ref: 7-7

Disposal Data

Label Data

Label Required: YES
Technical Review Date: 21FEB92
Label Date: 21FEB92
Label Status: G
Common Name: MINERAL SPIRITS, 40-8140-128
Chronic Hazard: NO
Signal Word: WARNING!
Acute Health Hazard-Slight: X
Contact Hazard-Slight: X
Fire Hazard-Moderate: X
Reactivity Hazard-None: X
Special Hazard Precautions: COMBUSTIBLE LIQUID, CLASS II. KEEP AWAY FROM CONTACT MAY IRRITATE EYES OR SKIN. BREATHING HIGH VAPOR CONCENTRATIONS MAY RESULT IN MILD DEPRESSION, DIZZINESS, HEADACHE, RESPIRATORY IRRITATION, CONVULSIONS, OR LOSS OF CONSCIOUSNESS. CHRONIC: NONE SPECIFIED BY MANUFACTURER.
Protect Eye: Y
Protect Skin: Y
Protect Respiratory: Y
Label Name: BUEHLER LTD
Label Street: 41 WAUKEGAN RD
Label City: LAKE BLUFF
Label State: IL
Label Zip Code: 60044
Label Country: US
Label Emergency Number: 708-295-6500

ULTRA SCIENTIFIC -- US-116 POLYNUCLEAR AROMATIC HYDROCARBONS MIXTURE
MATERIAL SAFETY DATA SHEET
NSN: 681000F037641
Manufacturer's CAGE: 0MU35
Part No. Indicator: A
Part Number/Trade Name: US-116 POLYNUCLEAR AROMATIC HYDROCARBONS MIXTURE

General Information

Item Name: AT 2000 UG/ML IN METHYLENE CHLORIDE/BENZENE
Company's Name: ULTRA SCIENTIFIC
Company's Street: 250 SMITH STREET
Company's City: NORTH KINGSTOWN
Company's State: RI
Company's Country: US
Company's Zip Code: 02852-5000
Company's Emerg Ph #: 401-294-9400
Company's Info Ph #: 401-294-9400
Record No. For Safety Entry: 001
Tot Safety Entries This Stk#: 001
Status: SE
Date MSDS Prepared: 15AUG94
Safety Data Review Date: 13DEC94
Preparer's Company: ULTRA SCIENTIFIC
Preparer's St Or P. O. Box: 250 SMITH STREET
Preparer's City: NORTH KINGSTOWN
Preparer's State: RI
Preparer's Zip Code: 02852-5000
MSDS Serial Number: BWJNN

Ingredients/Identity Information

Proprietary: NO
Ingredient: DICHLOROMETHANE (METHYLENE CHLORIDE) (SUSP HUMAN CARC BY ACGIH, SUSP ANIM CARC BY IARC; NTP - IARC GROUP 2B) *94-4*
Ingredient Sequence Number: 01
Percent: 49.82
NIOSH (RTECS) Number: PA8050000
CAS Number: 75-09-2
ACGIH TLV: 174 MG/CUM (A2)

Proprietary: NO
Ingredient: BENZENE (SUSPECTED HUMAN CARC BY ACGIH, IARC, SUSPECTED ANIMAL CARC BY IARC, CARCINOGEN BY NTP - GROUP 1) *94-4*
Ingredient Sequence Number: 02
Percent: 49.82
NIOSH (RTECS) Number: CY1400000
CAS Number: 71-43-2
ACGIH TLV: 0.3 MG/CUM (A2) IC
Other Recommended Limit: 16 MG/CUM

Proprietary: NO
Ingredient: 7,12-DIMETHYLBENZ~A!ANTHRACENE
Ingredient Sequence Number: 03
Percent: 0.182
NIOSH (RTECS) Number: CW3850000
CAS Number: 57-97-6

Proprietary: NO
Ingredient: 3-METHYLCHOLANTHRENE
Ingredient Sequence Number: 04
Percent: 0.182
NIOSH (RTECS) Number: FZ3675000
CAS Number: 56-49-5

Physical/Chemical Characteristics

Appearance And Odor: LIQUID

Fire and Explosion Hazard Data

Extinguishing Media: CO2, DRY CHEMICAL POWDER, WATER SPRAY

Reactivity Data

Stability: YES
Materials To Avoid: STRONG OXIDIZERS
Hazardous Poly Occur: NO

Health Hazard Data

LD50-LC50 Mixture: ORAL LD50 (RAT): 2136 MG/KG (SEE SUPP)
Route Of Entry - Inhalation: YES
Route Of Entry - Skin: NO
Route Of Entry - Ingestion: NO
Health Haz Acute And Chronic: TOXIC, IRRITATION.
Carcinogenicity - NTP: YES
Carcinogenicity - IARC: YES
Carcinogenicity - OSHA: NO
Explanation Carcinogenicity: SEE INGREDIENTS
Signs/Symptoms Of Overexp: IRRITATION.
Emergency/First Aid Proc: EYES/SKIN: FLUSH W/COPIOUS AMOUNTS OF WATER. INHALATION: REMOVE TO FRESH AIR. GIVE OXYGEN, IF NEEDED. OBTAIN MEDICAL ATTENTION IN ALL CASES.

Precautions for Safe Handling and Use

Steps If Matl Released/Spill: A LEAKING BOTTLE MAY BE PLACED IN A PLASTIC BAG & NORMAL DISPOSAL PROCEDURES FOLLOWED. LIQUID SAMPLES MAY BE ABSORBED ON VERMICULITE/SAND.
Waste Disposal Method: BURN IN A CHEMICAL INCINERATOR EQUIPPED W/AN AFTERBURNER & SCRUBBER. DISPOSE OF IAW/FEDERAL, STATE & LOCAL REGULATIONS.
Precautions-Handling/Storing: USE APPROPRIATE OSHA/MSHA APPROVED SAFETY EQUIPMENT. KEEP TIGHTLY CLOSED & STORE IN A COOL, DRY PLACE.
Other Precautions: THIS MATERIAL SHOULD ONLY BE USED BY THOSE PERSONS TRAINED IN THE SAFE HANDLING OF HAZARDOUS CHEMICALS.

Control Measures

Protective Gloves: REQUIRED
Eye Protection: CHEMICAL GOGGLES, FACESHIELD
Other Protective Equipment: CHEMICAL RESISTANT CLOTHING, LAB COAT/RUBBER APRON.
Suppl. Safety & Health Data: ORAL LD50 INFORMATION IS FOR METHYLENE CHLORIDE.

Transportation Data

Disposal Data

Label Data

Label Required: YES
Label Status: G
Common Name: US-116 POLYNUCLEAR AROMATIC HYDROCARBONS MIXTURE
Special Hazard Precautions: TOXIC, IRRITATION. IRRITATION.
Label Name: ULTRA SCIENTIFIC
Label Street: 250 SMITH STREET

Label City: NORTH KINGSTOWN
Label State: RI
Label Zip Code: 02852-5000
Label Country: US
Label Emergency Number: 401-294-9400

APPENDIX B

ACTIVITY HAZARD ANALYSIS

ACTIVITY HAZARD ANALYSIS
MOBILIZATION

Principal Steps	Potential Hazard	Recommended Controls
Installation of office and support structures	Heavy lifting	Use proper lifting techniques. Lifts greater and support structures than 60 lbs. require assistance or mechanical equipment; size-up the lift. Recommend wearing a back support if possible.
	Noise	Hearing protection is mandatory above 85 dBA.
	Falling objects	Hardhat, stay alert and clear of materials suspended overhead, steel-toed boots.
	Flying debris, dirt, dust, etc.	Safety glasses/eye wash.
	Pinch points	Keep hands and feet clear of moving/suspended materials and equipment.
		Stay alert at all times!
		Beware of contact points.
	Fire	Fire extinguishers shall be suitably placed, distinctly marked, readily accessible, and maintained in a fully chaged and operable condition See Table T-3
		Fire lane all areas shall maintained free of obstruction (the minimum space between one-story non-fire-resistant buildings shall be 20 feet). Initial survey of the suitability and effectiveness of fire prevention and protection measures and facilities at each installation shall be made by competent persons.
	High winds	Mobile/portable facilities shall be anchored to withstand high winds.
	Hot work	Refer to H&S Policy HS 314.
	Vehicle traffic	Pay attention at all times.
		Make sure that operators of vehicles know that you are near their equipment.
		A spotter will aid in the backing of all vehicles with poor rear visibility.

ACTIVITY HAZARD ANALYSIS
MOBILIZATION
(Continued)

Principal Steps	Potential Hazard	Recommended Controls
Installation of office and support structures	Contact with utilities	Above and underground utilities shall be and support structures located. A qualified person shall install required utilities in compliance with national state, and local codes.
	Slip, trip, and fall	Determine best access route before and support structures hazards transporting equipment.
		Good housekeeping, keep work area picked up and clean as feasible. Continually inspect the work area for slip, trip, and fall hazards.
		Look before you step, ensure safe and secure footing.
	Cut hazards	Wear adequate hand protection. Biological hazardsInspect work area carefully and avoid placing
		hands or feet into concealed areas. Be alert for bees, spiders, ticks, and snakes.
	Hazardous plants (poison oak prevalent), insects, snakes, etc.	Remove vegetation, identify hazardous plants, insects, etc.
	Flood potentials	Check meteorology/climatology of area; history of flooding.
	Toilets (sanitary)	Chemical toilets provided in accordance with SHSP.
	Heat stress	Refer to Section 3.2.
	Fire	Fire extinguishA-s~e suitably placed, distinctly marked, readily accessible, and maintained in a fully charged and operable condition.
		Fuel will be transported and stored in approved containers.
	Contact with moving equipment/vehicles	Work area will be barricaded/demarcated.
	Hazard communications	Label all containers as to contents (fuel cans, etc.)

ACTIVITY HAZARD ANALYSIS
MOBILIZATION
(Continued)

Principal Steps	Potential Hazard	Recommended Controls
Installation of office and support structures	Hazard communications	Obtain Material Safety Data Sheets for materials brought on site.
	Cross contamination and contact with potentially contaminated materials	No Exclusion Zone activities are associated with this task.
	Strains and sprains	Use the proper tool for the job being performed.
		Get assistance if needed.
		Avoid twisting/turning while pulling on tools, materials, etc.
	Unattended worker	"Buddy system" visual contact will be maintained between personnel during site activities.
Mobilization of trailers	Driving over soft ground	Make initial visual check. Level ground with loader and spread gravel.
		Apply gravel if needed to prevent mud of standing water. Loader (if used for spreading or grading) must meet all safety requirements.
	Level/Blocking trailer, driving stakes (stabilization) anchoring	Use caution when jacking and placing blocks or cribbing. If ground is soft, add stone to secure footing.
	Setting steps in place	Steps must be OSHA-approved (with proper handrails, midrail, steps, with a platform in front of door; Refer to USACE (Section 21.E, 02, 05, 07, 08).
		Lighting for work and means of egres; electrical hookup to trailers to be made by qualified electrician. GFCIs required on all circuits.
	Clearing hazards	If clearing is necessary, tree cutting will comply with chainsaw equipment manufacturer's safety standards.
	Ventilation	Trailer ventilation shall not bring in exhaust from vehicles, etc.

ACTIVITY HAZARD ANALYSIS
MOBILIZATION
(Continued)

Principal Steps	Potential Hazard	Recommended Controls
Equipment to be Used	**Inspection Requirements**	**Training Requirements**
• Hand tools • PPE • Heavy equipment • Vendor trucks	• Pre-post maintenance • Visual prior to use	• Tailgate Safety Meeting • Site specific orientation • Hazard communication review of site chemical concerns and MSDS.

ACTIVITY HAZARD ANALYSIS
SITE PREPARATION

Activity	Potential Hazards	Recommended Controls
Placement/unloading of construction materials	Noise	Noise levels above 85 dBA mandates hearing protection.
	Slip, trip, and fall hazards	Good housekeeping, keep work area picked up and as clean as feasible. Continually inspect the work area for slip, trip, and fall hazards.
	Pinch points	Keep feet and hands clear of moving/suspended materials and equipment.
		Beware of contact points.
		Stay alert at all times!
	Fire	Fire extinguishers shall be suitably placed, distinctly marked, readily accessible, and maintained in a fully charged and operable condition. See Table 3-6.
	Strains and sprains	Use proper lifting techniques, lifts greater than 60 lbs. require assistance or mechanical equipment. Size up the lift.
	Heavy equipment operations	Before any machinery or mechanized equipment is placed into service, it shall be inspected and tested by a competent mechanic and certified to be in safe operating condition.
		Equipment shall be inspected before being placed into service and at the beginning of each shift.
		Preventive maintenance procedures recommended by the manufacturer shall be followed.
		All lockout-tagout procedure shall be used for equipment found to be faulty or undergoing maintenance.
		Machinery and mechanized equipment shall be operated only by designated personnel.
		Getting off or on any equipment while it is in motion is prohibited.
		Machinery or equipment requiring an operator shall not be permitted to run unattended.

ACTIVITY HAZARD ANALYSIS
SITE PREPARATION
(Continued)

Activity	Potential Hazards	Recommended Controls
Placement/unloading of construction materials	Heavy equipment operations	Machinery or equipment will not be operated in a manner that will endanger persons or property nor will the safe operating speeds or loads be exceeded.
		All machinery or equipment will be shut down and positive means taken to prevent its operation while repairs or manual lubrications are being done.
		All repairs on machinery or equipment will be made at a location which provides protection from traffic for repair persons.
		Bulldozer and scraper blades, end-loader buckets, and similar equipment will be either fully lowered or blocked when being repaired or when not in use.
	Ropes, slings, chains, and hooks	The use of ropes, slings and chains shall be in accordance with the safe recommendations of their manufacturer.
		Rigging equipment shall not be loaded in excess of its recommended safe working load.
		The use of open hooks is prohibited in rigging to lift any load where there is danger of relieving the tension on the hook due to the load or hook catching or fouling.
		Hooks, shackles, rings, pad eyes and other fittings that show excessive wear or that have been bent, twisted or otherwise damaged shall be removed from service.
		Rigging equipment for material handling shall be inspected prior to use on each shift and as necessary during it use to insure that it is safe. Defective rigging equipment shall be removed from service.
		Rigging equipment, when not in use, shall be removed from the immediate work area and properly stored so as not to present a hazard.
		Taglines shall be used to control the loads being handled by hoisting equipment.

ACTIVITY HAZARD ANALYSIS
SITE PREPARATION
(Continued)

Activity	Potential Hazards	Recommended Controls
Placement/unloading of construction materials	Hoisting equipment	All hoisting equipment shall be capable of passing a performance (operating) test prior to being placed into service.
		At no time shall the hoisting equipment be loaded in excess of the manufacturers rating.
		While hoisting equipment is in operation, the operator shall not perform any other work and he/she shall not leave his/her position at the controls until the load has been safely landed or returned to the ground.
		A standard signal system shall be used on all hoisting equipment.
Support area construction	Knife cuts	Cutting strokes will always be away from the body.
		Leather gloves will be worn when cutting.
		Place knife in sheath on holder when not in use.
		Unused knives will never be left with cutting edges exposed.
		Never use a knife that is defective or has a broken blade or handle.
		Never use a knife as a prybar or screwdriver.
		Don't use a dull blade; replace or have sharpened prior to use.
	Pinch points	Keep feet and hands clear of moving/suspended materials and equipment.
		Stay alert at all times!
	Flying debris	Wear safety glasses at all times.
	Fire	A dry chemical fire extinguisher with a minimum UL rating of 1A5BC will be readily available.
	Fire	No smoking or open flames within 50 ft. of the work area. (Work area will be posted)

ACTIVITY HAZARD ANALYSIS
SITE PREPARATION
(Continued)

Activity	Potential Hazards	Recommended Controls
Support area construction		Fire extinguishers shall be suitably placed, distinctly marked, readily accessible, and maintained in a fully charged and operable condition. See Table 3.6.
		All hoses, couplings, fixtures, etc. shall be properly bonded and grounded.
		IT Corporation's HS314 "Hot Work in Hazardous Locations" Policy and Procedure shall be adhered to at all times.
	Fueling	Only UL/FM approved safety cans shall be used to store fuel.
		Do not refuel equipment while it is operating.
		Fire extinguishers shall be suitably placed, distinctly marked, readily accessible, and maintained in a fully charged and operable condition. See Table 3.6.
	Faulty or damaged equipment	Before any machinery or mechanized equipment is placed into service, it shall be inspected and tested by a competent mechanic and certified to be in safe operating condition.
		Equipment shall be inspected before being placed into service and at the beginning of each shift.
	Electrical hand tools/electrocution	Preventive maintenance procedures recommended by the manufacturer shall be followed.
		A lockout-tagout procedure shall be used for equipment found to be faulty or undergoing maintenance.
		Ground fault circuit interrupters inspect extension cords, hand tool inspection, lockout-tagout procedure.
	Contact with glues, solvents, etc.	Be familiar with the materials you are working with (MSDSs)
	Noise	If noise levels exceed 85 dBA wear hearing protection.

ACTIVITY HAZARD ANALYSIS
SITE PREPARATION
(Continued)

Activity	Potential Hazards	Recommended Controls
Support area construction	Heavy lifting	Safe lifting procedures. Loads over 60 lbs require assistance or mechanical lifting device.
	Slip, trip, and fall hazards	Good housekeeping
	Excavation and trenching	Follow policy and procedures for safe trench excavation.
Handling sharp objects	Cuts	Wear appropriate hand protection.
Grinding/sawing	Flying particles	Proper eye protection.
Material storage	Flammable and combustible liquids	Store in NO SMOKING AREA and 50 ft. from combustible construction materials.
		Fire extinguisher readily available. See Table 3.6.
		Properly grounded and bonded.
	Round stock	Secure from rolling, work from the top of the stack.
	Slip, trip, and fall hazards	Good housekeeping
	Sprains and strains	Safe lifting procedures
	Pinch points/cuts	Adequate hand protection and observation of contact points.
	Hazard communication	Proper labeling/MSDSs.
Application of sealants	Pinch points	Beware of contact points.
		Keep hands, fingers, and feet clear of moving parts.
		Stay alert at all times!
	Cut hazards	Wear adequate hand protection.
	Noise	Noise levels above 85 dBA mandate hearing protection.
	Heavy lifting	Any lifting over 60 lbs. requires assistance or the use of a mechanical lifting device.
	Moving equipment	Signal person will assist in positioning equipment.
		Signal person will wear a reflective vest for high visibility.
	Contact with sealants	Personnel will wear adequate protective clothing and equipment to protect themselves against contact with sealant.

ACTIVITY HAZARD ANALYSIS
SITE PREPARATION
(Continued)

Activity	Potential Hazards	Recommended Controls
Application of sealants	Contact with sealants	MSDS's of all sealant materials will be obtained and reviewed with applicable personnel.
Material hauling	Dump truck operations	Dump truck bodies shall be fully lowered or blocked when maintenance is being performed or when not in use.
		Dump trucks will have back-up alarms.
		A signal person will be used when the point of operation is not in full view of the vehicle, machine or equipment operator; vehicles are backed more than 100 ft; terrain is hazardous; or 2 or more vehicles are backing in the same area.
		Dump trucks will not be loaded in a manner that obscures the operator's view ahead or to either side or that interferes with the safe operation of the vehicle.
		The load on every truck will be distributed, checked, tied down, or secured.
		Loads will be covered when there is a hazard of flying/falling dirt, rock, debris, or material.
		All dump trucks will be equipped with a holding device to prevent accidental lowering of the body.
		All hoist levers will be secured to prevent accidental starting or tripping of the mechanism.
		Trip handles for tailgates will be arranged to keep the operator in the clear.
Equipment to be Used	**Inspection Requirements**	**Training Requirements**
• Heavy equipment • PPE • Dump trucks • Hand tools	• Pre-postmaintenance • Visual prior to use • CESPD Form 150 R	• Tailgate Safety Meeting • Site specific orientation • Hazardous waste operations • Hazard communication

ACTIVITY HAZARD ANALYSIS
SOIL/WATER SAMPLING

Activity	Potential Hazards	Recommended Controls
Staging equipment	Slip, trip, and fall hazards	Determine best access route before transporting equipment.
		Good housekeeping, keep work area picked up and clean as feasible. Continually inspect the work area for slip, trip and fall hazards.
		Look before you step, insure safe and secure footing.
	Heavy lifting	Use proper lifting techniques. Lifts greater than 60 lbs. require assistance or mechanical equipment; size-up the lift.
	Falling objects	Stay alert and clear of materials suspended overhead. Use steel-toed boots and hard hat.
	Flying debris, dirt, dust etc.	Use safety glasses/goggles. Ensure that eye wash is in good working order.
	Pinch points	Keep hands, fingers, and feet clear of moving/suspended materials and equipment.
		Beware of contact points.
		Stay alert at all times!
	Insects, spiders, and snakes	Inspect work area carefully and avoid placing hands and feet into concealed areas.
	Cut hazards	Wear adequate hand protection. Use care when handling glassware.
	Fire	Fire extinguishers shall be suitably placed, distinctly marked, readily accessible, and maintained in a fully charged and operable condition. See Table 3-6.
	Fire/chemical exposure	All solvents will be transported in UL/FM approved containers and sources of ignition will be prohibited.
		Initial real time air monitoring will take place.
	Contact with moving equipment/vehicles	Work area will be barricaded/demarcated.
		Equipment will be laid out in an area free of traffic flow..
	Work in excavations	IT Policy and Procedure HS 307 - "Excavation and Trenching" will be adhered to at all times

ACTIVITY HAZARD ANALYSIS
SOIL/WATER SAMPLING
(Continued)

Activity	Potential Hazards	Recommended Controls
Staging equipment	Hazard communication	Label all containers as to contents and dispose of properly.
		Obtain Material Safety Data Sheets for solvents, etc. that are being used.
	Noise	Sound levels above 85 dBA mandates hearing protection.
Sample collection	Working at elevated heights/falls	Ladders will be secured by top, bottom, and intermediate fastenings as required.
		Personnel working at heights of 6 feet or more must be secured with fall protection (safety belt/lanyard).
	Electrical shock	All electrical circuits will be deenergized and locked out.
	Insects, spiders, and snakes	Inspect work areas carefully and avoid placing hands and feet into concealed areas.
	Cross-contamination and contact with potentially contaminated materials	Sampling technicians will wear proper protective clothing and equipment to safeguard against potential contamination.
		Only essential personnel will be in the work area.
		Initial real-time air monitoring will take place before and during sampling activities.
		All personnel will follow good hygiene practices.
		Proper decontamination procedures will be followed.
		All liquids and materials used for decontamination will be contained and disposed of in accordance with Federal, State and Local regulations.
	Cut hazards	Use care when handling glassware.
		Wear adequate hand protection.
	Hazard communication	Label all containers as to contents.
	Strains/sprains	Use the proper tool for the job being performed.
		Get assistance if needed.

ACTIVITY HAZARD ANALYSIS
SOIL/WATER SAMPLING
(Continued)

Activity	Potential Hazards	Recommended Controls
Sample collection	Strains/sprains	Avoid twisting/turning while pulling on tools, grates, manway covers, etc.
	Spills/residual materials	Absorbent material and containers will be kept available where leaks or spills may occur.
	Lighting	Adequate lighting will be provided to insure a safe working environment.
	Unattended worker	"Buddy System" - visual contact will be maintained with the sampling technician during sampling activities.
	Confined spaces	IT Policy and Procedure HS300 - "Confined Spaces" will be adhered to at all times.
	Contact with potentially contaminated materials	Real-time air monitoring will take place. Appropriate PPE will be utilized.
		Good housekeeping will be stressed to safeguard against cross contamination of nearby areas and eliminate safety hazards.
		All site personnel will practice good personal hygiene by utilizing the decon facility on site.
		The work area will be demarcated. All unnecessary personnel will be kept out of the work area and in an upwind location.
		IT Policy and Procedure HS601 - "Respiratory Protective Devices" will be adhered to at all times.
		Maintain MSDS's for any preservatives such as HCl acid. Follow protection procedures.
Equipment decontamination	Chemical exposure	Maintain MSDS's for all chemicals such as methanol or hexane and follow protection procedures.
On-site sample analysis	Various	On-site laboratory will develop and adhere to a site specific chemical hygiene plan (CHP). The CHP will be submitted to the Program CIH for review and acceptance.
Moving and shipping collected samples	Heavy lifting	Use proper lifting techniques. Lifts greater than 60 lbs. require assistance or mechanical equipment; size-up the lift.

ACTIVITY HAZARD ANALYSIS
SOIL/WATER SAMPLING
(Continued)

Activity	Potential Hazards	Recommended Controls
Moving and shipping collected samples	Pinch points	Keep hands, fingers, and feet clear of moving/suspended materials and equipment.
		Beware of contact points.
		Stay alert at all times!
	Cut hazards	Wear adequate hand protection. Use care when handling glassware.
	Hazard communication	Label all containers as to contents and associated hazards.
Equipment to be Used	**Inspection Requirements**	**Training Requirements**
• Hand tools • PPE • Sampling equipment	• Pre-postmaintenance • Visual prior to use	• Tailgate Safety Meeting • Site specific orientation • Hazardous waste operations • Hazard communication • Lead Control Plan (if applicable) • UXO Training

ACTIVITY HAZARD ANALYSIS
REMOVAL OF CONTAMINATED SOILS

Activity	Potential Hazards	Recommended Controls
Loading stockpile	Noise	Noise levels above 85 dBA mandates hearing protection.
	Heavy equipment operations	Before any machinery or mechanized equipment is placed into service, it shall be inspected and tested by a competent mechanic and certified to be in safe operating condition.
		Equipment shall be inspected before being placed into service and at the beginning of each shift.
		Preventive maintenance procedures recommended by the manufacturer shall be followed.
		A lockout - tagout procedure shall be used for equipment found to be faulty or undergoing maintenance.
		Machinery and mechanized equipment shall be operated only by designated personnel.
		Getting off or on any equipment while it is in motion is prohibited.
		Machinery or equipment requiring an operator shall not be permitted to run unattended.
	Contact with overhead power lines	See distances in Table 3-5.
	Heavy equipment operations	Machinery or equipment will not be operated in a manner that will endanger persons or property nor will the safe operating speeds or loads be exceeded.
		All machinery or equipment will be shut down and positive means taken to prevent its operation while repairs or manual lubrications are being done.
		All repairs on machinery or equipment will be made at a location which provides protection from traffic for repair persons.
		Bulldozer and scraper blades, end-loader buckets, and similar equipment will be either fully lowered or blocked when being repaired or when not in use.
		All self-propelled construction equipment shall be equipped with a back-up alarm.

ACTIVITY HAZARD ANALYSIS
REMOVAL OF CONTAMINATED SOILS

Activity	Potential Hazards	Recommended Controls
Loading stockpile	Fire	Each bulldozer, backhoe, or other similar equipment will be equipped with at least one dry chemical fire extinguisher having a minimum UL rating of 1A5BC.
	Contact with potentially contaminated materials	Real-time air monitoring will take place. Proper personal protective clothing and equipment will be utilized.
		Good housekeeping will be stressed to safe guard against cross contamination of surrounding areas and eliminate safety hazards.
		All site personnel will practice good personal hygiene.
		The work area will be demarcated. All unnecessary personnel will be kept out of the work area and in an upwind location.
		Refer to Section 3.2 of SHSP for chemical hazard discussion.
	Noise	Noise levels above 85 dBA mandates hearing protection.
	Slip, trip, and fall hazards	Good housekeeping, keep work area picked up and as clean as feasible. Continually inspect the work area for slip, trip, and fall hazards.
	Pinch points	Keep feet and hands clear of moving/suspended materials and equipment.
		Beware of contact points.
		Stay alert at all times!
	Strains and sprains	Use proper lifting techniques, lifts greater than 60 lbs. requires assistance or mechanical equipment; size up the lift.
Material hauling	Dump truck operations	Dump truck bodies shall be fully lowered or blocked when maintenance is being performed or when not in use.
		Dump trucks will have back-up alarms.

ACTIVITY HAZARD ANALYSIS
REMOVAL OF CONTAMINATED SOILS

Activity	Potential Hazards	Recommended Controls
Material hauling		A signal person will be used when the point of operation is not in full view of the vehicle, machine or equipment operator; vehicles are backed more than 100 ft; terrain is hazardous; or 2 or more vehicles are backing in the same area.
		Dump trucks will not be loaded in a manner that obscures the operator's view ahead or to either side or that interferes with the safe operation of the vehicle.
		The load on every truck will be distributed, checked, tied down, or secured.
		Loads will be covered when there is a hazard of flying/falling dirt, rock, debris, or material.
		All dump trucks will be equipped with a holding device to prevent accidental lowering of the body.
		All hoist levers will be secured to prevent accidental starting or tripping of the mechanism.
	Dump truck operations	Trip handles for tailgates will be arranged to keep the operator in the clear.

Equipment to be Used	Inspection Requirements	Training Requirements
• Hand tools • PPE • Heavy equipment • Dump trucks	• Pre-postmaintenance • Visual prior to use • CESPD Form 150 R	• Tailgate Safety Meeting • Site specific orientation • Hazardous waste operations • Hazard communication

ACTIVITY HAZARD ANALYSIS
REMOVAL AND DISPOSAL OF CARBON ABSORBTION DRUMS

Activity	Potential Hazards	Recommended Controls
Loading stockpile	Noise	Noise levels above 85 dBA mandates hearing protection.
	Heavy equipment operations	Before any machinery or mechanized equipment is placed into service, it shall be inspected and tested by a competent mechanic and certified to be in safe operating condition.
		Equipment shall be inspected before being placed into service and at the beginning of each shift.
		Preventive maintenance procedures recommended by the manufacturer shall be followed.
		A lockout - tagout procedure shall be used for equipment found to be faulty or undergoing maintenance.
		Machinery and mechanized equipment shall be operated only by designated personnel.
		Getting off or on any equipment while it is in motion is prohibited.
		Machinery or equipment requiring an operator shall not be permitted to run unattended.
	Contact with overhead power lines	See distances in Table 3-5.
	Heavy equipment operations	Machinery or equipment will not be operated in a manner that will endanger persons or property nor will the safe operating speeds or loads be exceeded.
		All machinery or equipment will be shut down and positive means taken to prevent its operation while repairs or manual lubrications are being done.
		All repairs on machinery or equipment will be made at a location which provides protection from traffic for repair persons.
		Bulldozer and scraper blades, end-loader buckets, and similar equipment will be either fully lowered or blocked when being repaired or when not in use.
		All self-propelled construction equipment shall be equipped with a back-up alarm.

ACTIVITY HAZARD ANALYSIS
REMOVAL AND DISPOSAL OF CARBON ABSORBTION DRUMS
(Continued)

Activity	Potential Hazards	Recommended Controls
Loading stockpile	Fire	Each bulldozer, backhoe, or other similar equipment will be equipped with at least one dry chemical fire extinguisher having a minimum UL rating of 1A5BC.
	Contact with potentially contaminated materials	Real-time air monitoring will take place. Proper personal protective clothing and equipment will be utilized.
		Good housekeeping will be stressed to safe guard against cross contamination of surrounding areas and eliminate safety hazards.
		All site personnel will practice good personal hygiene.
		The work area will be demarcated. All unnecessary personnel will be kept out of the work area and in an upwind location.
		Refer to Section 3.2 of SHSP for chemical hazard discussion.
	Noise	Noise levels above 85 dBA mandates hearing protection.
	Slip, trip, and fall hazards	Good housekeeping, keep work area picked up and as clean as feasible. Continually inspect the work area for slip, trip, and fall hazards.
	Pinch points	Keep feet and hands clear of moving/suspended materials and equipment.
		Beware of contact points.
		Stay alert at all times!
	Strains and sprains	Use proper lifting techniques, lifts greater than 60 lbs. requires assistance or mechanical equipment; size up the lift.
Material hauling	Dump truck operations	Dump truck bodies shall be fully lowered or blocked when maintenance is being performed or when not in use.
		Dump trucks will have back-up alarms.

ACTIVITY HAZARD ANALYSIS
REMOVAL AND DISPOSAL OF CARBON ABSORBTION DRUMS
(Continued)

Activity	Potential Hazards	Recommended Controls
Material hauling		A signal person will be used when the point of operation is not in full view of the vehicle, machine or equipment operator; vehicles are backed more than 100 ft; terrain is hazardous; or 2 or more vehicles are backing in the same area.
		Dump trucks will not be loaded in a manner that obscures the operator's view ahead or to either side or that interferes with the safe operation of the vehicle.
		The load on every truck will be distributed, checked, tied down, or secured.
		Loads will be covered when there is a hazard of flying/falling dirt, rock, debris, or material.
		All dump trucks will be equipped with a holding device to prevent accidental lowering of the body.
		All hoist levers will be secured to prevent accidental starting or tripping of the mechanism.
	Dump truck operations	Trip handles for tailgates will be arranged to keep the operator in the clear.

Equipment to be Used	Inspection Requirements	Training Requirements
• Hand tools • PPE • Heavy equipment • Dump trucks	• Pre-postmaintenance • Visual prior to use • CESPD Form 150 R	• Tailgate Safety Meeting • Site specific orientation • Hazardous waste operations • Hazard communication

ACTIVITY HAZARD ANALYSIS
REMOVAL AND STOCKPILING OF AERATION EQUIPMENT

Activity	Potential Hazards	Recommended Controls
Loading stockpile	Noise	Noise levels above 85 dBA mandates hearing protection.
	Heavy equipment operations	Before any machinery or mechanized equipment is placed into service, it shall be inspected and tested by a competent mechanic and certified to be in safe operating condition.
		Equipment shall be inspected before being placed into service and at the beginning of each shift.
		Preventive maintenance procedures recommended by the manufacturer shall be followed.
		A lockout - tagout procedure shall be used for equipment found to be faulty or undergoing maintenance.
		Machinery and mechanized equipment shall be operated only by designated personnel.
		Getting off or on any equipment while it is in motion is prohibited.
		Machinery or equipment requiring an operator shall not be permitted to run unattended.
	Contact with overhead power lines	See distances in Table 3-5.
	Heavy equipment operations	Machinery or equipment will not be operated in a manner that will endanger persons or property nor will the safe operating speeds or loads be exceeded.
		All machinery or equipment will be shut down and positive means taken to prevent its operation while repairs or manual lubrications are being done.
		All repairs on machinery or equipment will be made at a location which provides protection from traffic for repair persons.
		Bulldozer and scraper blades, end-loader buckets, and similar equipment will be either fully lowered or blocked when being repaired or when not in use.
		All self-propelled construction equipment shall be equipped with a back-up alarm.

ACTIVITY HAZARD ANALYSIS
REMOVAL AND STOCKPILING OF AERATION EQUIPMENT
(Continued)

Activity	Potential Hazards	Recommended Controls
Loading stockpile	Fire	Each bulldozer, backhoe, or other similar equipment will be equipped with at least one dry chemical fire extinguisher having a minimum UL rating of 1A5BC.
	Contact with potentially contaminated materials	Real-time air monitoring will take place. Proper personal protective clothing and equipment will be utilized.
		Good housekeeping will be stressed to safe guard against cross contamination of surrounding areas and eliminate safety hazards.
		All site personnel will practice good personal hygiene.
		The work area will be demarcated. All unnecessary personnel will be kept out of the work area and in an upwind location.
		Refer to Section 3.2 of SHSP for chemical hazard discussion.
	Noise	Noise levels above 85 dBA mandates hearing protection.
	Slip, trip, and fall hazards	Good housekeeping, keep work area picked up and as clean as feasible. Continually inspect the work area for slip, trip, and fall hazards.
	Pinch points	Keep feet and hands clear of moving/suspended materials and equipment.
		Beware of contact points.
		Stay alert at all times!
	Strains and sprains	Use proper lifting techniques, lifts greater than 60 lbs. requires assistance or mechanical equipment; size up the lift.
Material hauling	Dump truck operations	Dump truck bodies shall be fully lowered or blocked when maintenance is being performed or when not in use.
		Dump trucks will have back-up alarms.

ACTIVITY HAZARD ANALYSIS
REMOVAL AND STOCKPILING OF AERATION EQUIPMENT
(Continued)

Activity	Potential Hazards	Recommended Controls
Material hauling		A signal person will be used when the point of operation is not in full view of the vehicle, machine or equipment operator; vehicles are backed more than 100 ft; terrain is hazardous; or 2 or more vehicles are backing in the same area.
		Dump trucks will not be loaded in a manner that obscures the operator's view ahead or to either side or that interferes with the safe operation of the vehicle.
		The load on every truck will be distributed, checked, tied down, or secured.
		Loads will be covered when there is a hazard of flying/falling dirt, rock, debris, or material.
		All dump trucks will be equipped with a holding device to prevent accidental lowering of the body.
		All hoist levers will be secured to prevent accidental starting or tripping of the mechanism.
	Dump truck operations	Trip handles for tailgates will be arranged to keep the operator in the clear.

Equipment to be Used	Inspection Requirements	Training Requirements
• Hand tools • PPE • Heavy equipment • Dump trucks	• Pre-postmaintenance • Visual prior to use • CESPD Form 150 R	• Tailgate Safety Meeting • Site specific orientation • Hazardous waste operations • Hazard communication

ACTIVITY HAZARD ANALYSIS
DECONTAMINATION OF EQUIPMENT

Activity	Potential Hazards	Recommended Controls
Job setup for decontamination of equipment	Heavy lifting	Use proper lifting techniques. Lifts greater than 60 lbs. require assistance or mechanical equipment; size-up the lift. Recommend wearing a back support if possible.
	Slip, trip, and fall hazards	Good housekeeping, keep work area picked up and as clean as feasible. Continually inspect the work area for slip, trip and fall hazards.
	Cut hazards	Wear adequate hand protection.
	Lighting	Adequate lighting will be provided to ensure a safe working environment.
	Strains/sprains	When pulling or lifting, do not turn or twist your back.
		Use the proper tool for the task being performed.
	Contact with potentially contaminated materials	Appropriate PPE protection will be required.
		Real time air monitoring will take place during decontamination activities.
		Keep airborne particulates to a minimum.
		Practice good housekeeping, avoid spreading potentially contaminated materials.
	Fueling	Only UL/FM approved safety cans shall be used to store fuel.
		Do not refuel equipment while it is operating.
		Fire extinguishers rated at a minimum of 20BC shall be suitably placed, distinctly marked, readily accessible, and maintained in a fully charged and operable condition. See Table 3-6
	Faulty or damaged equipment	Before any machinery or mechanized equipment is placed into service, it shall be inspected and tested by a competent mechanic and certified to be in safe operating condition.
		Equipment shall be inspected before being placed into service and at the beginning of each shift.

ACTIVITY HAZARD ANALYSIS
DECONTAMINATION OF EQUIPMENT
(Continued)

Activity	Potential Hazards	Recommended Controls
Job setup for decontamination of equipment		Preventive maintenance procedures recommended by the manufacturer shall be followed.
		A lockout - tagout procedure shall be used for equipment found to be faulty or undergoing maintenance.
Pressure washing equipment	High pressures	IT Policy and Procedure HS303 "Pressured water cleaning and cutting equipment" shall be adhered to at all times.
		The operator shall be thoroughly instructed in handling and operating the gun, nozzle and controls prior to operating the unit.
		Deadman controls shall not be lashed down or rendered inoperative.
		Full Face protection shall be used at all times. This will include safety glasses/goggles and a face shield or a full face respirator.
		The operator shall wear metatarsal covers (guards) at all times
		At no time shall the pressure washer be used to wash/decon personnel.
	Unqualified operators	Machinery and mechanized equipment shall be operated only by designated personnel.
	Out of control equipment	Machinery or equipment requiring an operator shall not be permitted to run unattended.
		Machinery or equipment will not be operated in a manner that will endanger persons or property nor will the safe operating speeds or loads be exceeded.
	Noise	Sound levels above 85 dBA mandates hearing protection.
	Activation during repairs	All machinery or equipment will be shut down and positive means taken to prevent its operation while repairs or manual lubrications are being done.

ACTIVITY HAZARD ANALYSIS
DECONTAMINATION OF EQUIPMENT
(Continued)

Activity	Potential Hazards	Recommended Controls
Pressure washing equipment	Pinch points	Keep feet and hands clear of moving/suspended materials and equipment.
		Stay alert at all times!
	Falling objects	Hardhats, remove unsecured tools and materials before operating equipment.
	Falling objects	Stay alert and clear of materials suspended overhead.
	Flying debris	Splash shield will be used.
	Contact with potentially contaminated materials	Appropriate PPE will be required.
	Hot work (hot water/steam cleaning)	IT Policy and Procedure HS314 "Hot Work in Hazardous Locations" will be adhered to at all times during any operations involving hot work.
Stage-setup equipment for pumping liquids	Pinch points	Keep hands, fingers, and feet clear of moving parts.
	Heavy lifting	Any lifting over 60 lbs requires assistance or the use of a mechanical lifting device.
	Moving equipment	Signal person will assist in positioning equipment.
	Contact with potentially contaminated materials	Real time air monitoring will take place. Appropriate PPE protection will be required.
Pumping liquids	Faulty equipment	Equipment will be inspected prior to being placed into service and at the beginning of each shift.
	Pressurized systems	All discharge hoses and connections shall be routinely inspected.
	Noise	Sound levels above 85 dBA mandates hearing protection.
	Fire	A dry chemical fire extinguisher with a minimum UL rating of 1A5BC will be readily available.
	Refueling	Proper bonding and grounding. Only UL/FM approved safety cans will be used.

ACTIVITY HAZARD ANALYSIS
DECONTAMINATION OF EQUIPMENT
(Continued)

Activity	Potential Hazards	Recommended Controls
Pumping liquids	Noise	Noise levels above 85 dBA mandates hearing protection.
	Heavy equipment operations	Before any machinery or mechanized equipment is placed into service, it shall be inspected and tested by a competent mechanic and certified to be in safe operating condition.
		Equipment shall be inspected before being placed into service and at the beginning of each shift.
		Preventive maintenance procedures recommended by the manufacturer shall be followed.
		A lockout - tagout procedure shall be used for equipment found to be faulty or undergoing maintenance.
Loadout of equipment		Machinery and mechanized equipment shall be operated only by designated personnel.
		Getting on or off any equipment while it is in motion is prohibited.
		Machinery or equipment requiring an operator shall not be permitted to run unattended.
		Machinery or equipment will not be operated in a manner that will endanger persons or property nor will the safe operating speeds or loads be exceeded.
		All machinery or equipment will be shutdown and positive means taken to prevent its operation while repairs or manual lubrications are being done.
		All repairs on machinery or equipment will be made at a location which provides protection from traffic for repair persons.
		All self-propelled construction equipment shall be equipped with a back-up alarm.

ACTIVITY HAZARD ANALYSIS
DECONTAMINATION OF EQUIPMENT
(Continued)

Activity	Potential Hazards	Recommended Controls
Loadout of equipment	Fire	Each bulldozer, backhoe, or other similar equipment will be equipped with at least one dry chemical fire extinguisher having a minimum UL rating of 1A5BC.
	Truck and equipment traffic	Site personnel will wear orange safety vests to identify themselves to traffic.
		Load out area will be properly demarcated. Ground personnel to make eye contact with equipment/vehicle operators prior to traffic zone entry. Ground personnel will avoid blind spots directly in front of and directly behind equipment/vehicles.
	Slip, trip, and fall hazards	Good housekeeping, keep work area picked up and as clean as feasible. Continually inspect the work area for slip, trip, and fall hazards. Look where you step, ensure safe footing when climbing on/off equipment etc.
	Pinch points	Keep feet and hands clear of moving/suspended materials and equipment.
		Beware of contact points. Stay alert at all times!
	Strains/sprains	Use proper lifting techniques. Lifts greater than 60 lbs require assistance or mechanical equipment. Size-up the lift. When pulling on materials, pull in a straight line. Do not twist and pull simultaneously.
	Ropes, slings, chains, and hooks	The use of ropes, slings, and chains shall be in accordance with the safe recommendations of their manufacturer.
		Rigging equipment shall not be loaded in excess of its recommended safe working load.
		The use of open hooks is prohibited in rigging to lift any load where there is danger of relieving the tension on the hook due to the load or hook catching or fouling.

ACTIVITY HAZARD ANALYSIS
DECONTAMINATION OF EQUIPMENT
(Continued)

Activity	Potential Hazards	Recommended Controls
Loadout of equipment		Hooks, shackles, rings, pad eyes, and other fittings that show excessive wear or that have been bent, twisted, or otherwise damaged shall be removed from service.
		Rigging equipment for material handling shall be inspected prior to use on each shift and as necessary during its use to insure that it is safe. Defective rigging equipment shall be removed from service.
	Ropes, slings, chains, and hooks	Rigging equipment, when not is use, shall be removed from the immediate work area and properly stored so as not to present a hazard.
		Taglines shall be used to control the loads being handled by hoisting equipment.
	Hoisting equipment	All hoisting equipment shall be capable of passing a performance (operating) test prior to being placed into service.
		At no time shall the hoisting equipment be loaded in excess of the manufacturers rating except during performance tests.
		While hoisting equipment is in operation, the operator shall not perform any other work and he/she shall not leave his/her position at the controls until the load has been safely landed or returned to the ground.
		A standard signal system shall be used on all hoisting equipment.
	Heat	Be aware of warning signs of these conditions
	Insects, spiders, and snakes	Inspect work area carefully and avoid placing hands and feet into concealed areas.
	Cut hazards	Wear adequate hand protection.
	Falling objects	Hardhat, stay alert and clear of materials suspended overhead, steel-toed boots.

ACTIVITY HAZARD ANALYSIS
DECONTAMINATION OF EQUIPMENT
(Continued)

Activity	Potential Hazards	Recommended Controls
Equipment to be Used	**Inspection Requirements**	**Training Requirements**
•Hand tools •PPE •Heavy equipment •Pressure Washer	•Pre-postmaintenance •Visual prior to use •CESPD Form 150 R	•Tailgate Safety Meeting •Site specific orientation •Hazardous waste operations •Hazard communication •Pressure washer training